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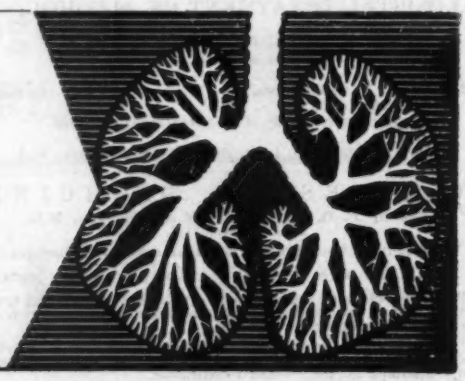

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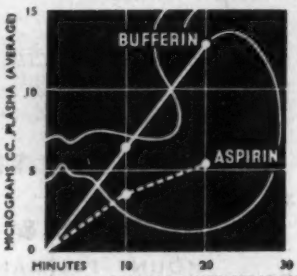

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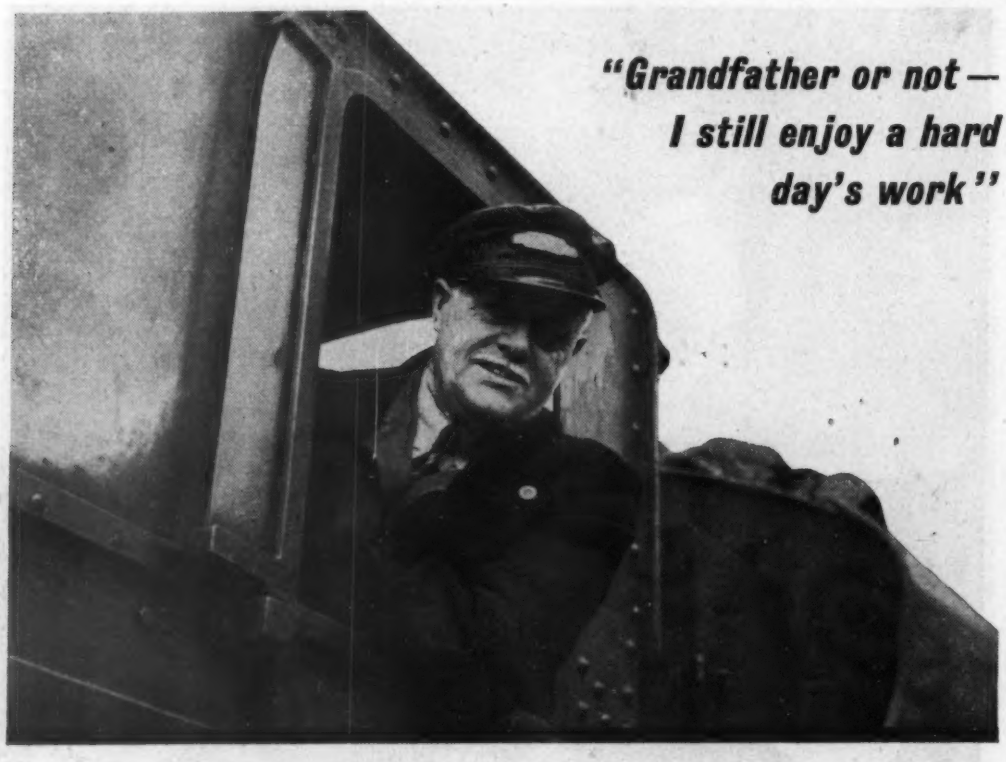

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Bottles of 30 Capsules

dry-filled capsules for more rapid and complete absorption . . . no after taste

*REGD. TRADE MARK

Each capsule contains :

Vitamin A	5,000 I.U.	Calcium pantothenate	5 mg.	Calcium (As $CaHPO_4$)	145 mg.
Vitamin D (Viosterol)	500 I.U.	Choline dihydrogen citrate	100 mg.	Phosphorus (As $CaHPO_4$)	110 mg.
Vitamin B_{12}	1 microgram	Inositol	50 mg.	Boron (As $Na_2B_4O_7.10H_2O$)	0·1 mg.
Thiamine mononitrate	5 mg.	Ascorbic Acid (C)	50 mg.	Copper (As CuO)	1 mg.
Riboflavine (B_2)	5 mg.	Vitamin E	10 Units	Manganese (As MnO_2)	1 mg.
Niacinamide	15 mg.	Rutin	25 mg.	Fluorine (As CaF_2)	0·1 mg.
Folic Acid	1 mg.	Pyridoxine HCl (B_6)	0·5 mg.	Magnesium (As MgO)	1 mg.
Purified intrinsic factor concentrate	0·5 mg.	Iron (As $FeSO_4$)	10 mg.	Potassium (As K_2SO_4)	5 mg.
		Iodine (As KI)	0·5 mg.	Zinc (As ZnO)	0·5 mg.

CYANAMID 1907 50 1957

LEDERLE LABORATORIES DIVISION

Cyanamid OF GREAT BRITAIN LTD., London, W.C.2

For the treatment and relief of all rheumatic and muscular pain

FINALGON, a neurovascular rubefacient of unique formulation, is the safe and rapid prescription. Quickly producing pronounced capillary and arteriolar dilatation and prolonged hyperæmia, it results in greatly increased local warmth and a consequent rapid relief from pain.

INDICATIONS

Lumbago, fibrositis, myositis, sciatica, rheumatism, and all types of pain caused by muscular strain.

FINALGON*

Nonylic acid vanillylamide with the beta butoxyethyl ester of Nicotinic acid

Manufactured and distributed in the UK by Pfizer Ltd., Folkestone, Kent, for
C. H. Boehringer Sohn, Ingelheim am Rhein
Registered Proprietors of the Trade Mark **Regd. Trade Mark*

'Dettol' REGD. is active...

against both Gram-positive and Gram-negative micro-organisms.
Under standard conditions of test a dilution of 1 in 200 kills Staph. aureus in 10 minutes; a 1 in 500 dilution kills Strep. pyogenes in 10 minutes, and a 1 in 250 dilution kills Bact. coli in 10 minutes.

'Dettol'—retains a high degree of efficiency in the presence of organic matter.

'Dettol'—is not incompatible with soap, traces of which need not be removed before application.

'Dettol'—is non-poisonous and non-staining.

'Dettol'—is well tolerated by the skin and tissues.

INSTRUMENT 'DETTOL'
Instrument Dettol is widely used as a most effective and practical means of disinfecting surgical instruments—steel, stainless steel and plated, as well as glassware, rubber appliances and nylon sutures.

SURGICAL 'DETTOL'
Surgical Dettol is a specially formulated tincture for the surgical preparation of the skin. It remains actively bactericidal for a considerable period after drying. It dries quickly and leaves a non-slippery surface. Bactericidal action is not adversely affected by the use of ordinary soap solutions. Surgical Dettol in clinical use has proved non-toxic and non-irritant when used in accordance with the directions.

For leaflets giving full information on Instrument Dettol and Surgical Dettol *Please write to:*
RECKITT & COLMAN LTD.,
PHARMACEUTICAL DEPARTMENT, HULL.

Senokot

IN OBSTETRICS

Extract from the BRITISH MEDICAL JOURNAL February 23, 1957, p. 439.

A report on a controlled clinical trial:

"The continued use of senokot since the trial was completed has confirmed that it is a very satisfactory laxative for puerperal women. Its value during pregnancy is much more difficult to subject to clinical trial but it seems very satisfactory for this purpose. A few patients complaining of severe morning sickness have improved dramatically following the regular administration of senokot."

Rx Senokot

	BASIC N.H.S. PRICES (*Tax free D.P.s*)	RETAIL PRICES (*Including Tax*)
GRANULES:	2 lb, 21/-	2 oz, 2/10; 6 oz, 7/9
TABLETS:	1000, 16/-	50, 2/5; 200, 7/3

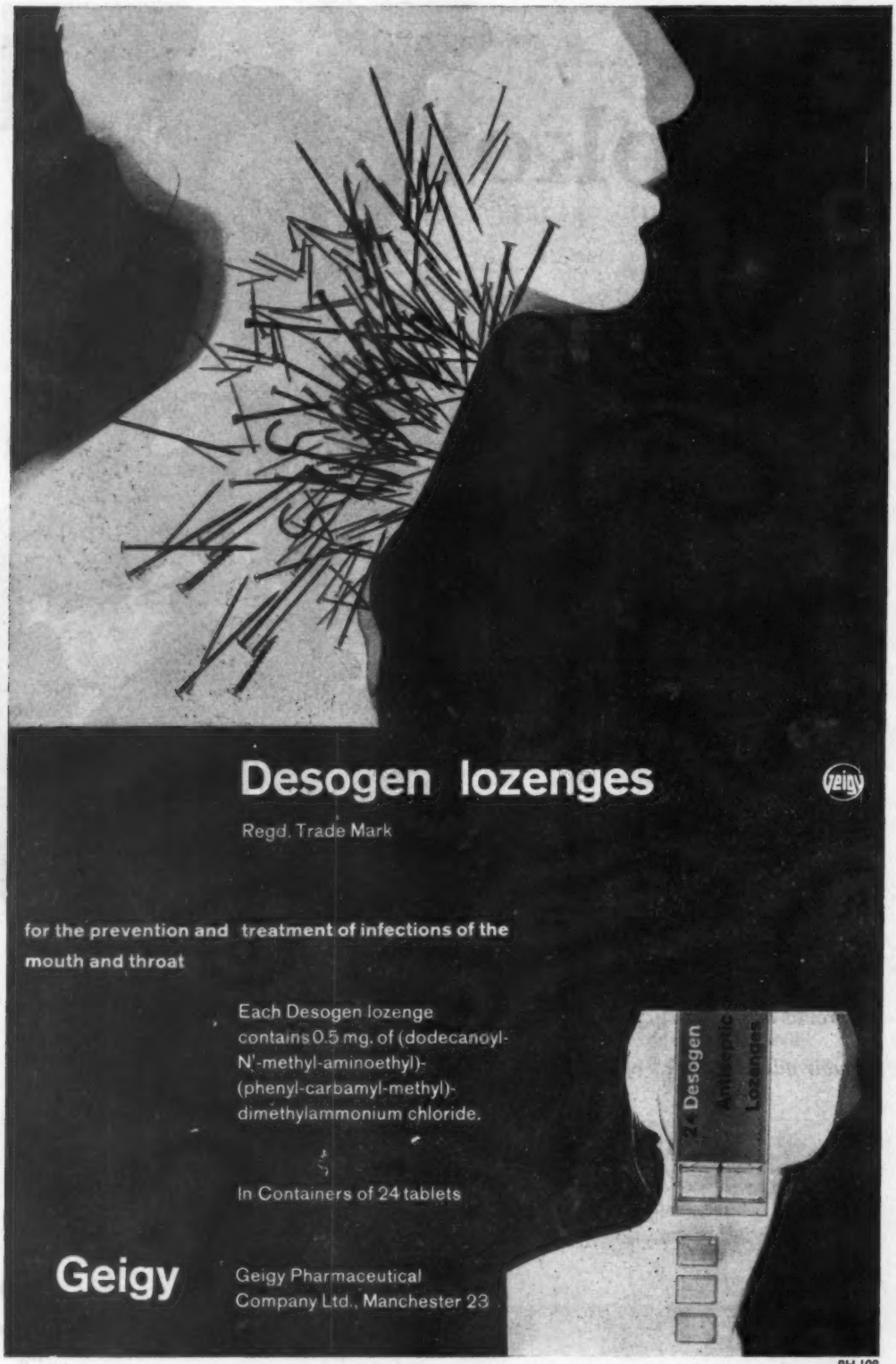
Cost about a halfpenny a dose.

STANDARDIZED SENNA

SENOKOT is not advertised to the public, has no B.P. or N.F. equivalent, and is freely prescribable under the N.H.S.

WESTMINSTER LABORATORIES LTD., CHALCOT RD., LONDON, N.W.1

G.492


Desogen lozenges
Regd. Trade Mark
for the prevention and treatment of infections of the mouth and throat
Each Desogen lozenge contains 0.5 mg. of (dodecanoyl-N'-methyl-aminoethyl)-(phenyl-carbamyl-methyl)-dimethylammonium chloride.
In Containers of 24 tablets
Geigy
Geigy Pharmaceutical Company Ltd., Manchester 23
24 Desogen Antiseptic Lozenges
PH.109

Relief of Rheumatic Pain in General Practice

RHEUMATIC PAIN, *it is estimated, brings 8 out of 10 patients to the surgery. Prompt and prolonged relief can safely be given, in all forms of rheumatism, by administering Berex in massive and prolonged dosage. No supervision is required.*

1. *Prompt relief by massive aspirin dosage without supervision*

It has been estimated that 8 out of 10 patients go to their doctors with some form of rheumatic complaint.

In all cases, the first aim is prompt relief, preferably calling for no supervision in administration.

An effective and safe remedy is massive aspirin dosage in the form of Berex tablets.

2. *Succinate prevents toxicity*

Clinical study* has shown that the calcium succinate in Berex prevents toxicity from massive dosage.

The prothrombin level is maintained and there is no hæmorrhagic tendency, even after prolonged dosage.

Your patients can enjoy prolonged relief, in safety, by reducing the initial dosage as soon as the pain diminishes.

Side effects — including gastric — are fewer and milder, if present at all.

3. *Encourages tissue respiration*

Experimentally, by Warburg test, it has been shown that the inhibitory action of salicylate on tissue respiration is completely offset when it is combined with succinate. Succinate encourages cellular respiration and stimulates the respiratory enzyme systems. It is to this stimulating action that the beneficial effect of succinate is attributed.

*"*No abnormal prolongation of prothrombin time even after 68 days of succinate-salicylate.*" "*The results also show that this succinate-salicylate formulation combines safety and efficacy, permitting wide use both for treatment and maintenance without the excessive supervision required in many other forms of therapy.*" Delaware State Med. J., 1954, 26, 22.

BEREX TRADE MARK

For prompt relief of pain associated with all forms of rheumatism.

FORMULA: Calcium succinate 2·8 gr. acetylsalicylic acid 3·7 gr.

IN TABLET FORM: basic N.H.S. price 4/8½d. — 100 tablets; 24/3d. — 600 tablets.

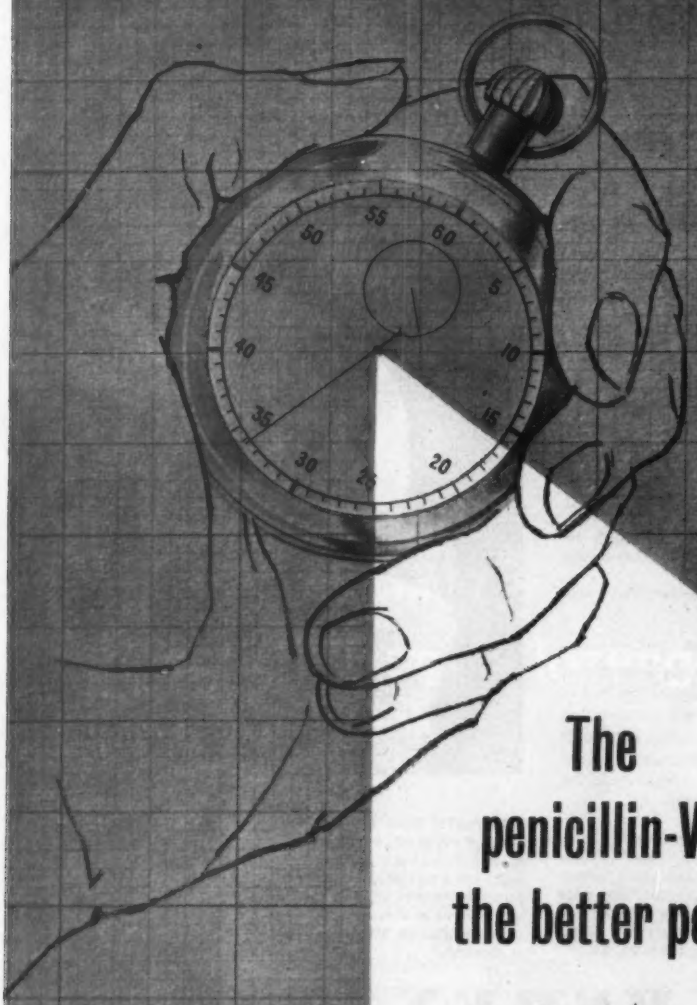
BEREX HAS NEVER BEEN ADVERTISED TO THE PUBLIC

A professional sample will gladly be sent on request to

MEDICAL DEPARTMENT
CLINOD PHARMACEUTICALS LTD., BELVUE ROAD, NORTHOLT, GREENFORD, MIDDX.

Calcipen-V

CALCIUM PENICILLIN V



The penicillin-V with the better performance

* more soluble than the free acid
* produces higher blood levels
* quicker onset of action

Literature and further information gladly sent on request

BOOTS PURE DRUG CO. LTD., NOTTINGHAM, ENGLAND

S.307

NO LONG FACES WHEN CHILDREN TAKE...

Maw's

Tancolin

CHILDREN'S COUGH LINCTUS

Active Ingredients	%W/V
Theophylline ...	0.33
Ethylmorphine Hydrochloride	0.025
Sodium Antimonyl Tartrate	0.00125
Ascorbic Acid ...	0.25
Glycerin ...	20.8
Sodium Citrate ...	2.0
Citric Acid ...	1.0

Tangerine Flavoured to provide an immediately acceptable and effective treatment, appealing instantly to even the most unco-operative child patient. Tancolin combines a pleasant vehicle with a rational formulation — specifically for children.

TANCOLIN has been designed to give a twofold anti-spasmodic and sedative action. The inclusion of a demulcent, a reflex expectorant and added Vitamin 'C' content are valuable adjuncts to this primary function.

TANCOLIN is indicated for treatment of the distressing and irritating cough associated with the common cold, Bronchospasm Bronchitis and Inflammatory and Catarrhal affections of the Respiratory Tract.

TANCOLIN is freely prescribable on E.C.10 (Cat. 3/4) and achieves therapeutic efficiency with economy.

S. Maw Son and Sons Limited · Barnet · England

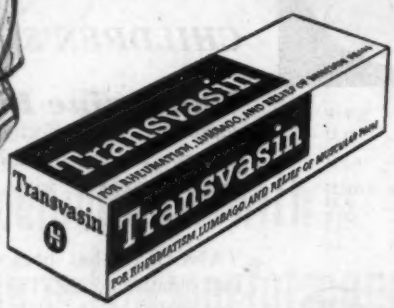
G147A

17

Transvasin

brings the esters of NICOTINIC ACID SALICYLIC ACID p-AMINOBENZOIC ACID to the focal point of soft-tissue rheumatism

The esters in Transvasin, a new preparation developed by Hamol S.A., our Swiss associates, readily pass the skin barrier in therapeutic quantities and enable an effective concentration of the drugs to be built up where they are needed.* Transvasin not only induces vasodilation of the skin with a superficial erythema, but also brings about a deep hyperaemia of the underlying tissues. It is non-irritant, and can be safely used on delicate skins. It is now being widely prescribed with successful clinical results. Since a very small quantity is sufficient for each application, the cost of treatment is extremely low.



Salicylic acid tetrahydrofurfuryl-ester	14%
Nicotinic acid ethyl-ester	2%
Nicotinic acid n-hexyl-ester	2%
p-Aminobenzoic acid ethyl-ester	2%
Water-miscible cream base ad	100%

**Therapeutische Umschau VIII*, 1952, 10, 143

Transvasin is available in 1 oz. tubes, basic N.H.S. price in the U.K. 2/6 plus P.T., and is not advertised to the public. It may be prescribed on Form E.C.10. Samples and literature will gladly be sent on application.

LLOYD-HAMOL LTD., 11 WATERLOO PLACE, LONDON, S.W.1. WHITEHALL 8654/5/6

Transvasin is the registered trade mark of Lloyd-Hamol Ltd.

. . . the chronic sufferer who no longer gets the same relief from his usual stomach mixture **needs a change of treatment.**

NEUTRADONNA

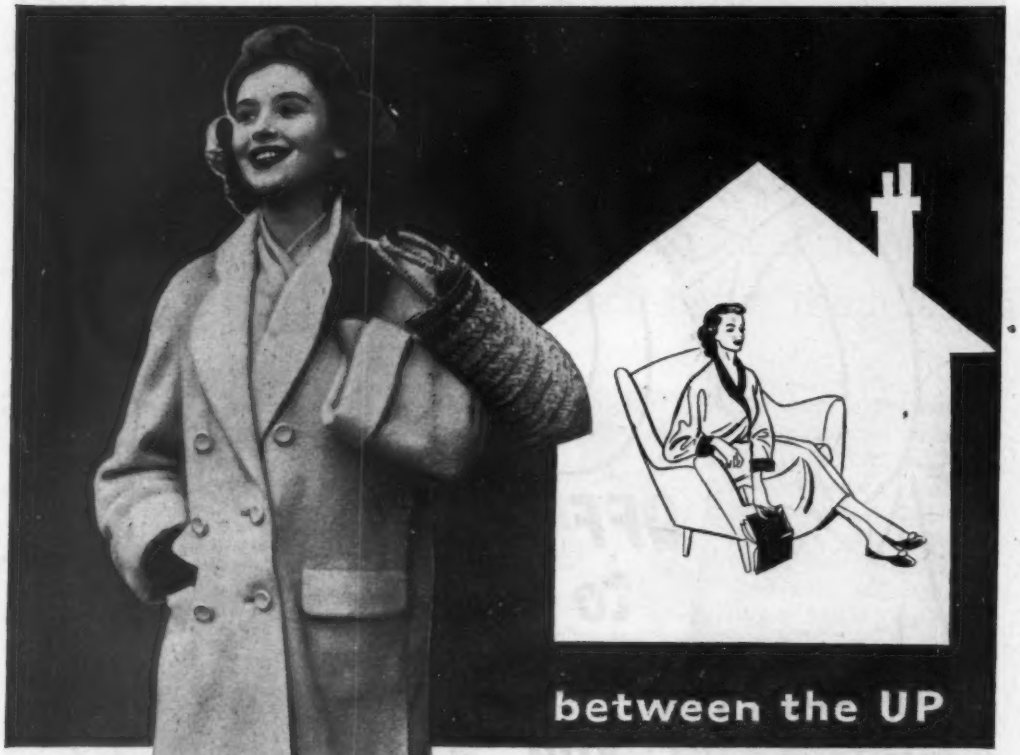
brings renewed control of symptoms in chronic dyspepsia and peptic ulcer.

In conjunction with a simple diet, Neutradonna is an ideal form of therapy, particularly in the ambulant patient.

NEUTRADONNA contains the buffer antacid, sodium aluminium silicate, and belladonna as an antispasmodic.

BS

NEUTRADONNA is a product of British Schering Limited, 229-231 Kensington High Street, London, W.8.



between the UP

and the ABOUT

INFLUENZA and other debilitating illnesses are inevitably followed by a frustrating period of convalescence. Metatone* with its stimulating, appetite-promoting combination of vitamin B_1, strychnine and mineral glycerophosphates is ideally suited for the rapid restoration of normal metabolic function.

FORMULA
Each fluid ounce of Metatone contains

Vitamin B_1	3 mg.
Calcium Glycerophosphate	4 grs.
Potassium Glycerophosphate	4 grs.
Sodium Glycerophosphate	2 grs.
Manganese Glycerophosphate	½ gr.
Strychnine Glycerophosphate	8/200 gr.

Available in bottles of 8, 16 and 80 fl. ozs.

METATONE

* *Trade Mark*

speeds the return to normal activity

PARKE, DAVIS & Co. Ltd., *(Inc. U.S.A.)* HOUNSLOW, MIDDLESEX. *Telephone: Hounslow 2361*

165

PRO-BANTHĪNE* IN ULCER HEALING

FIG. 1. *"But X-ray study at this time still revealed the ulcer niche."*

FIG. 2. *In ten weeks "the niche was no longer visible radiologically or gastroscopically."*

Clinical Report on Pro-Banthīne

The case-history below of ulcer on the gastric side of gastro-jejunal stoma reveals significantly the high potency in low dosage of the well-tolerated anti-cholinergic agent, Pro-Banthīne.

M. D., female, age 48, had a posterior gastro-jejunostomy fourteen years previously for duodenal ulcer Nine months prior to her first visit severe intractable pain recurred and a subtotal gastrectomy was performed at another hospital. She remained well for a few months and then because of recurrence of severe pain and marked weight loss, she was referred for treatment. X-ray study revealed a large ulcer niche on the gastric side of the anastomosis. Antacids and sedatives gave no relief from pain. She was given 60 mg. of Pro-Banthīne four times a day and within seventy-two hours was able to sleep through the night for the first time in weeks. After two weeks of Pro-Banthīne treatment the patient felt completely well, but X-ray study at this time still revealed the ulcer niche (Fig. 1). After a further ten weeks' treatment the niche was no longer visible radiologically or gastroscopically (Fig. 2). In the five months prior to the report she was maintained on 30 mg. of Pro-Banthīne four times daily without any recurrence of symptoms.

Pro-Banthīne, containing 15 mg. Propantheline Bromide, is the safe and potent anti-cholinergic which efficiently controls and decreases gastro-intestinal hypermotility and excess acidity. It has proved highly efficient not only in peptic ulcer but also in pancreatitis, hypertrophic gastritis, diverticulitis, biliary dyskinesia, spastic colon and other conditions.

Pro-Banthīne is also available compounded with Phenobarbitone (15 mg.) for the treatment of peptic ulcer when complicated by mental stress and anxiety. Both products are available in bottles of 40, 100 and 1000 tablets. G. D. Searle and Co. Ltd., High Wycombe, Bucks. Telephone : High Wycombe 1770.

* *Registered Trade Mark*

SEARLE

PB : P97

for chilblains...

STEROGYL-15

600,000 I.U. VITAMIN D2

oral — massive dose

3 doses 60% success

One ampoule weekly for three consecutive weeks

ALCOHOLIC FOR ADULTS OILY FOR INFANTS

ROUSSEL

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Plesmet

TABLETS

Plesmet perfects the acknowledged hæmopoietic efficiency of ferrous sulphate in all iron deficiency anæmias by ensuring that it is extraordinarily well tolerated—particularly in pregnancy and even in cases of peptic ulcer and gastritis.

EACH TABLET CONTAINS

Ferrous Aminoacetosulphate equivalent to 50 mgm. of Ferrous Iron with 1 mgm. of Aneurine Hydrochloride B.P.

Ferrous Sulphate—Glycine Complex

THE NEW WELL-TOLERATED ORAL TREATMENT FOR HYPOCHROMIC ANAEMIA

Basic N.H.S. Price: 100 tablets 2/8

1000 tablets 17/6

Daily average cost of treatment—1d.

C&C LTD. TRADE MARK

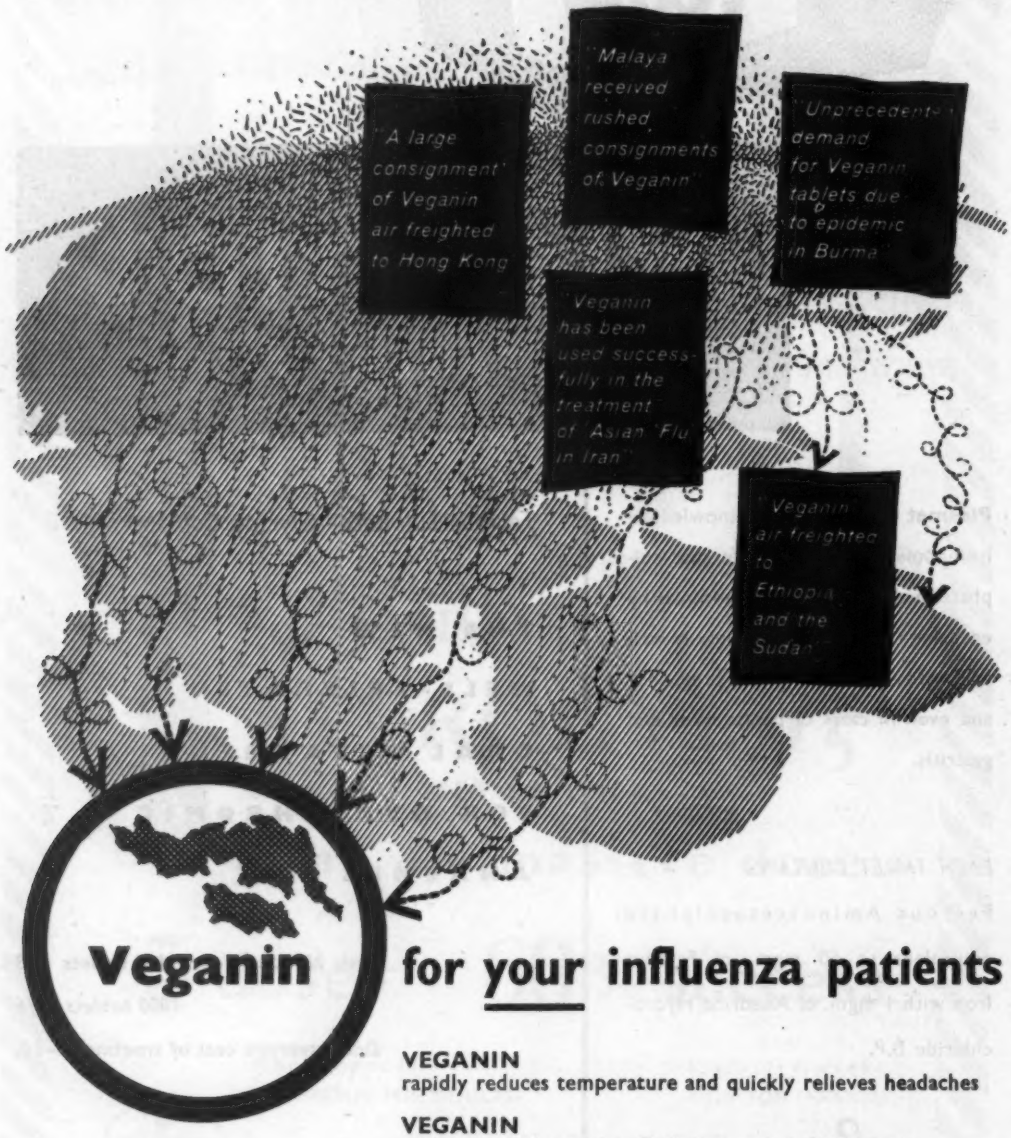
COATES & COOPER LTD.

PYRAMID WORKS • WEST DRAYTON • MIDDLESEX

MAXIMAL EFFICIENCY AT MINIMAL COST- WRITE FOR SAMPLES & LITERATURE

Veganin

proved relief for "Asian 'Flu" symptoms


"A large consignment of Veganin air freighted to Hong Kong
"Malaya received rushed consignments of Veganin"
"Unprecedented demand for Veganin tablets due to epidemic in Burma"
"Veganin has been used successfully in the treatment of Asian 'Flu in Iran"
"Veganin air freighted to Ethiopia and the Sudan"

Veganin **for your influenza patients**

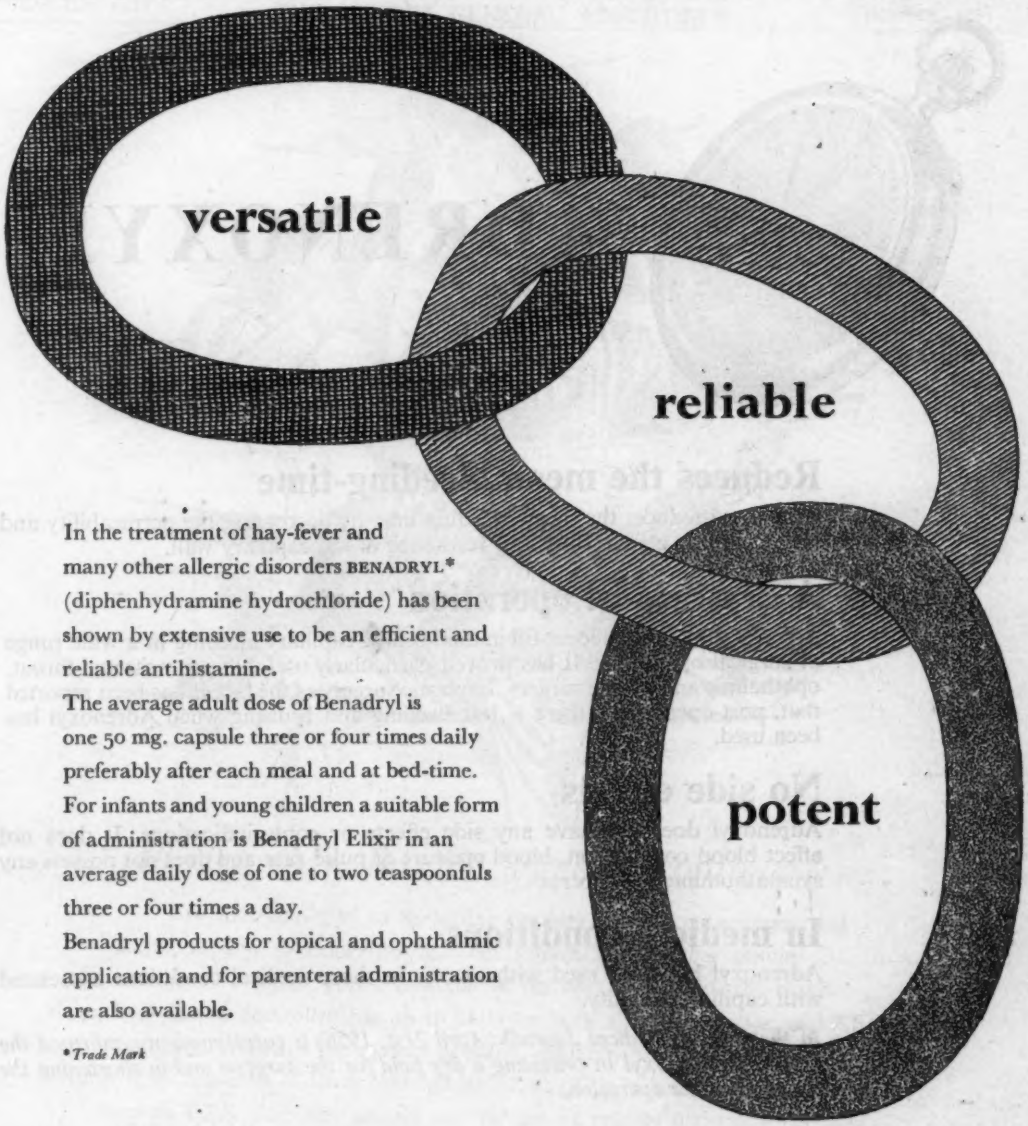
VEGANIN
rapidly reduces temperature and quickly relieves headaches

VEGANIN
tablets with their extra Codeine content disintegrate within 20 seconds and provide the ideally balanced formula

CAN BE PRESCRIBED ON E.C.10

Aspirin 250 mg. Phenacetin 250 mg. Codeine Phosphate 10 mg.
DOSAGE: For Asian 'Flu two tablets three times a day.

WILLIAM R. WARNER & CO. LTD, EASTLEIGH, HAMPSHIRE



In the treatment of hay-fever and many other allergic disorders BENADRYL* (diphenhydramine hydrochloride) has been shown by extensive use to be an efficient and reliable antihistamine.

The average adult dose of Benadryl is one 50 mg. capsule three or four times daily preferably after each meal and at bed-time.

For infants and young children a suitable form of administration is Benadryl Elixir in an average daily dose of one to two teaspoonfuls three or four times a day.

Benadryl products for topical and ophthalmic application and for parenteral administration are also available.

*Trade Mark

BENADRYL *in the relief of allergy*

BENADRYL CAPSULES (50 mg. and 25 mg.) bottles of 50 and 500.
BENADRYL ELIXIR: each 4 ml. (one teaspoonful) contains 10 mg. of Benadryl. Bottles of 4, 16 and 80 fl. ozs.

Benadryl Ophthalmic · Benylin Expectorant · Benadryl Cream
Benadryl Emplets · Caladryl Cream · Caladryl Lotion
Bena-Fedrin Nasal Decongestant

PARKE, DAVIS & COMPANY, LTD. *(inc. U.S.A.)* HOUNSLOW · MIDDLESEX · Tel. Hounslow 2361

800

25

ADRENOXYL

Reduces the mean bleeding-time

Adrenoxyl reduces the mean bleeding-time by decreasing the permeability and increasing the contractility and resistance of the capillary wall.

A dry field at operation

Adrenoxyl has been successful in diminishing capillary bleeding in a wide range of surgical operations. It has proved particularly useful in ear, nose and throat, ophthalmic and plastic surgery. In plastic surgery of the face it has been reported that, post-operatively, there is less swelling and bruising when Adrenoxyl has been used.

No side effects

Adrenoxyl does not have any side effects or contraindications. It does not affect blood coagulation, blood pressure or pulse rate and does not possess any sympathomimetic properties.

In medical conditions

Adrenoxyl has been used with success in those medical conditions associated with capillary fragility.

In the British Medical Journal (April 21st, 1956) a correspondent confirmed the value of Adrenoxyl in providing a dry field for the surgeon and in shortening the duration of the operation.

Packs

Ampoules: Boxes of 6 and boxes of 50.
Each ampoule contains 0.75 mg. of adrenochrome monosemicarbazone dihydrate.

Tablets: Tubes of 25 and bottles of 500.
Each tablet contains 2.5 mg. of adrenochrome monosemicarbazone dihydrate.

The best results are obtained when both tablets and ampoules are used.

HORLICKS LIMITED

Pharmaceutical Division Slough Bucks

Literature and samples are available on request to the Medical Information Dept.

"All right Mr. Baxter, shall we continue? . . .

. . . now that you seem to be getting the idea, just let me reiterate that I.Z.S., as you so neatly put it, 'has something the other insulins haven't got.' In other words, in about 90 per cent. of patients the blood-sugar level can be controlled for up to 24 hours with a single injection of I.Z.S.

When you compare the various insulins available, you'll find that no other form is so universal in its application as I.Z.S. This is, among other things, because I.Z.S. does not contain any protein or peptide material other than the insulin itself, and is therefore practically free of any allergic reactions. Perhaps Mr. Baxter will now give others a chance to raise their questions."

I.Z.S. A.B. Vials of 10 c.c. 40 or 80 units per c.c.

I.Z.S. (Amorphous) A.B. Vials of 10 c.c. 40 units per c.c.

I.Z.S. (Crystalline) A.B. Vials of 10 c.c. 40 units per c.c.

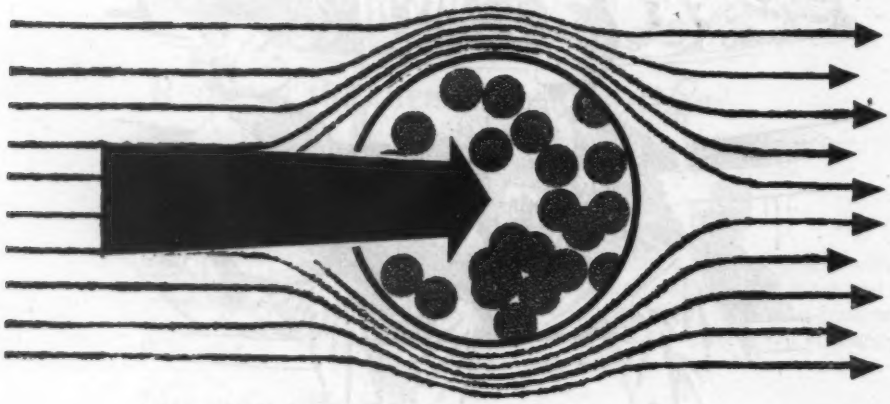
Insulin Zinc Suspension A.B.

A|B TRADE MARK

Joint Licensees and Manufacturers:

ALLEN & HANBURYS LTD LONDON E2 • THE BRITISH DRUG HOUSES LTD LONDON N1 •

BIOTEXIN defeats staphylococci that defeat other antibiotics



Biotexin (novobiocin sodium Glaxo) is the antibiotic that will deliver an overwhelming knock-out blow even to 'last-ditch' resisters. Orally administered, well absorbed and well tolerated, it swiftly produces high, sustained and selective bactericidal activity in the blood. Biotexin can be successfully used in the treatment of septicaemia, staphylococcal enterocolitis, infections of the soft tissues and other conditions that may be caused by staphylococci resistant to other antibiotics.

BIOTEXIN Novobiocin sodium Glaxo

TRADE MARK

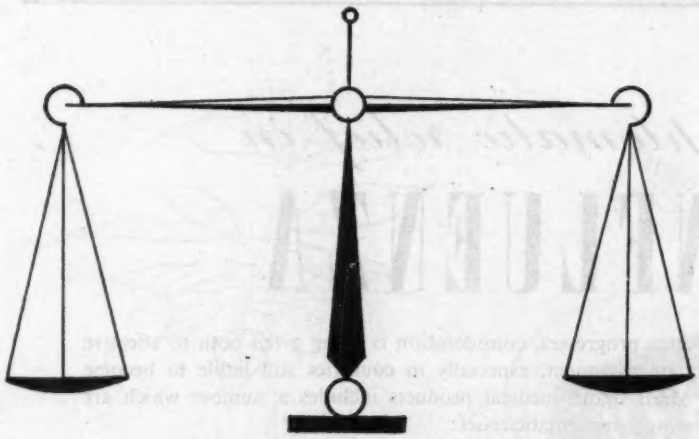
Tablets 125 mg. Bottles of 32 and 100

GLAXO LABORATORIES LTD., GREENFORD, MIDDLESEX

BYRon 3434

Subsidiary Companies or Agents in most countries

G2



IRON IN THE BALANCE

The balance between a positive and negative iron level is a much more delicate one than was formerly believed, particularly in healthy people. Thus young women and children, with their increasing demands for iron, may be placed in the precarious state where it needs only a cut in diet, coupled with poor absorption of available food iron, for hypochromic anaemia to develop.

Gluferate gets to the core of iron replacement therapy by providing iron in the readily useable and non-irritant form of ferrous gluconate and sufficient ascorbic acid to ensure improved absorption.

It offers a simple, reliably effective and economical method of prophylaxis and of treatment in all iron deficiency states.

GLUFERATE

TWO *haematinic aids in a* SINGLE *tablet*

PACKS:

Bottles of 30 and 250 tablets. Each tablet contains 300 mg. ferrous gluconate and 25 mg. ascorbic acid

Wyeth *The word 'Gluferate' is the registered trade mark of*

JOHN WYETH AND BROTHER LIMITED, CLIFTON HOUSE, EUSTON ROAD, LONDON, N.W.1

29

symptomatic relief in

INFLUENZA

As the Asiatic 'flu pandemic progresses, consideration is being given both to effective prevention and to adequate treatment, especially in countries still liable to become affected. The range of M&B brand medical products includes a number which are extremely useful in providing symptomatic relief:

'SULPHATRIAD' (trade mark / brand)
COMPOUND SULPHONAMIDES
— the safe sulphonamide combination for eliminating the secondary bacterial invaders.

'AVOMINE' (trade mark / brand)
PROMETHAZINE 8-CHLOROTHEOPHYLLINATE
— for rapid control of nausea and vomiting.

'ANTHISAN' (trade mark / brand)
MEPYRAMINE MALEATE
AND
'PHENERGAN' (trade mark / brand)
PROMETHAZINE HYDROCHLORIDE
— alternative antihistaminics for relief of nasal and chest congestion.

'PHENSEDYL' (trade mark / brand)
PROMETHAZINE COUGH LINCTUS
— a well balanced association of promethazine, codeine and ephedrine, long-established in the treatment of influenzal coughs.

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MAY & BAKER LTD

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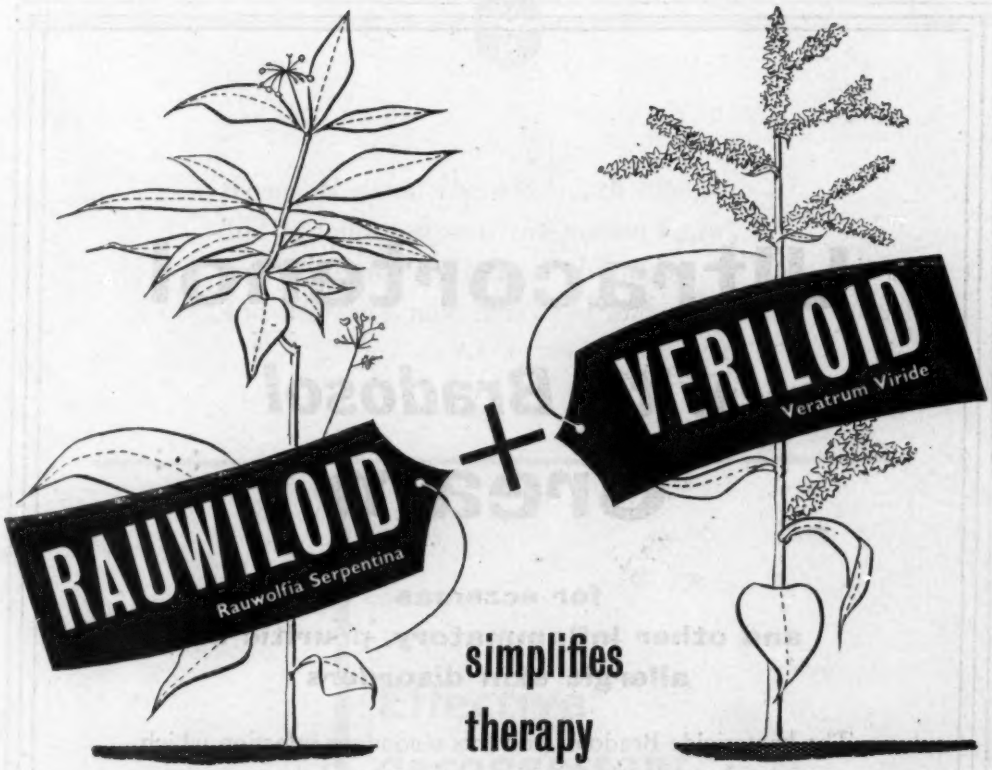
DISTRIBUTORS
PHARMACEUTICAL SPECIALITIES (MAY & BAKER) LTD · DAGENHAM



simplifies therapy in cases of moderate to severe hypertension . . .

'When treating moderate to moderately severe hypertension, there is a natural hesitation to use ganglionic or adrenergic-blocking agents because of their inherent dangers, the limitations they place on the patient, and the required extra supervision, all of which tend to create invalidism. These problems do not arise when Veratrum is used in conjunction with Rauwolfia . . . Life threatening side-actions, a constant threat when ganglionic -blocking agents are used, are never seen with 'Rauwiloid' plus 'Veriloid''. . .

(New York State J. Med., 1956.56:2523)

There is a valuable complementary action between 'Rauwiloid' and 'Veriloid', and the combination is a safe and effective therapy for moderate to severe hypertension.

'Rauwiloid' is a standardised preparation of the alkaloid hydrochlorides of *Rauwolfia serpentina*.

'Veriloid' is a fractionated alkaloidal extract of *Veratrum viride* which is biologically standardised.

'RAUWILOID + VERILOID'

RIKER

'Rauwiloid + Veriloid' is presented in bottles of 100 (approximately one month's treatment) and 500 tablets. Each tablet contains 1 mg. of 'Rauwiloid' and 3 mg. of 'Veriloid'.

'Rauwiloid' and 'Veriloid' are registered trade marks. Registered users:

RIKER LABORATORIES LTD., LOUGHBOROUGH, LEICS.

Ultracortenol
with Bradosol
Cream

for eczemas
and other inflammatory, pruritic or
allergic skin disorders

The bactericide Bradosol prevents secondary infection which tends to develop during cortico-steroid therapy.

PROMPT RELIEF OF SYMPTOMS

PROLONGED DURATION OF ACTION

Tubes of 5g. containing 0.5% prednisolone trimethylacetate and 0.05% β-phenoxy-ethyl-dimethyl-dodecyl ammonium bromide in a specially formulated base.

C I B A

'Ultracortenol' and 'Bradosol' are registered trade marks. Reg. user

CIBA LABORATORIES LIMITED · HORSHAM · SUSSEX

Telephone : Horsham 4321. Telegrams : Cibalabs, Horsham.

1/7

"... When all aloud the wind doth blow,
And coughing drowns the parson's saw,
And birds sit brooding in the snow
And Marion's nose looks red and raw ..."

Act V. Sc. II "Love's Labour's Lost" by
William Shakespeare.

Effective decongestant therapy

PIRIEX

Liquefies tenacious sputum and aids its prompt removal

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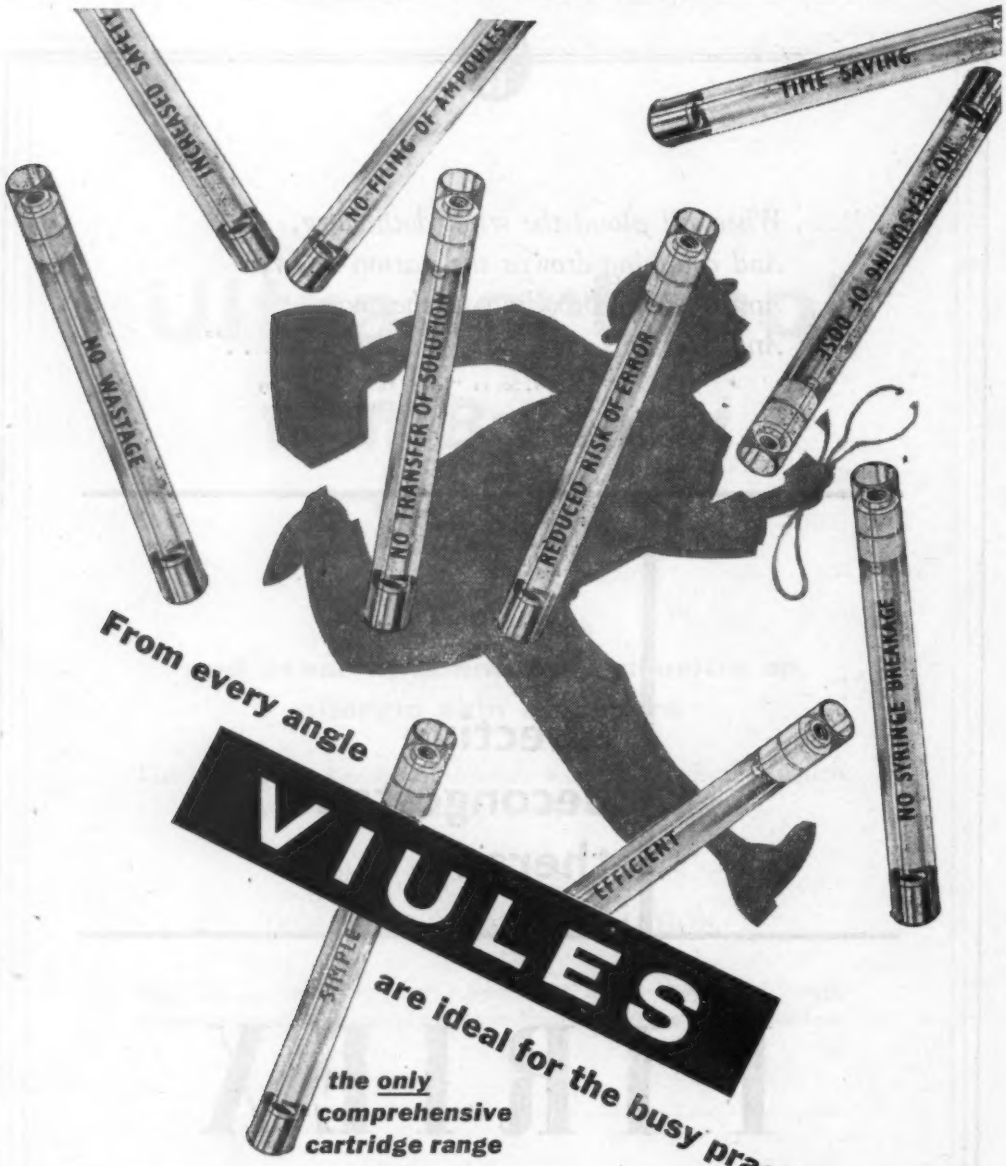

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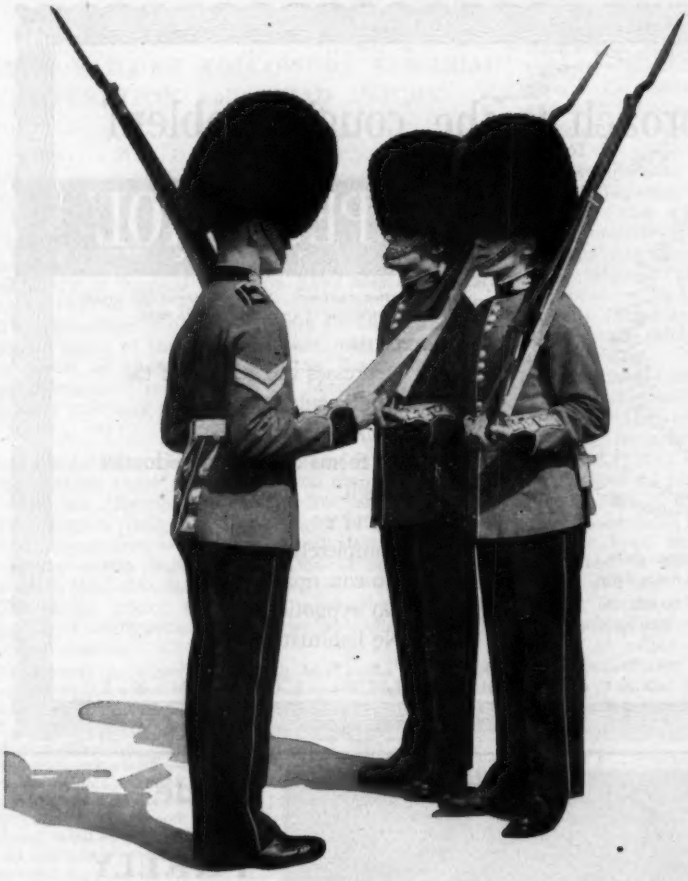

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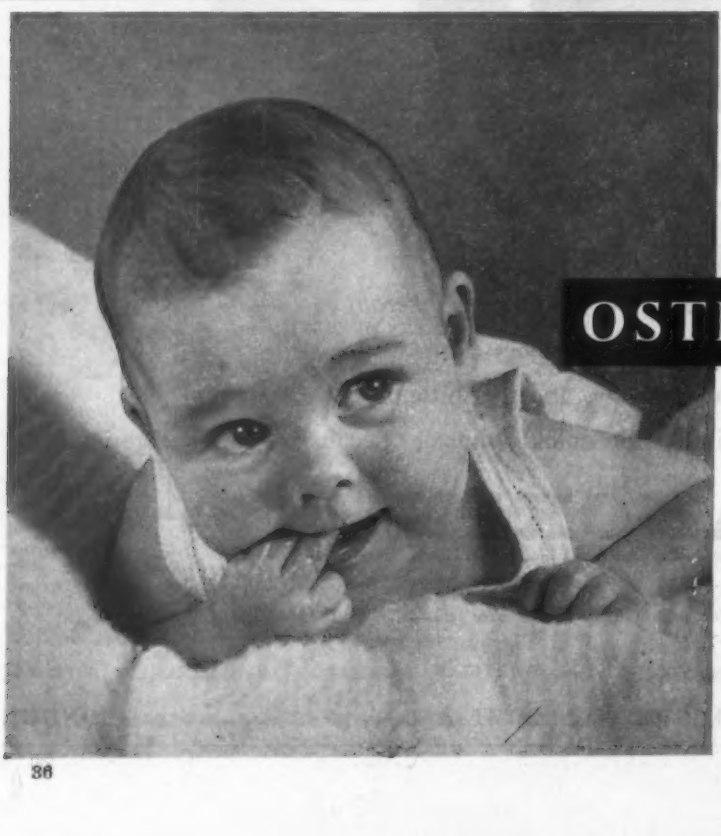

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MANAGEMENT OF ACUTE RENAL FAILURE FOLLOWING SURGICAL OPERATION AND HEAD INJURY

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THE clinical, biochemical, and pathological features of cases of acute renal failure following either civilian head injury or surgical operation have been previously reported (Taylor and Reid 1956), attention being drawn to differences from acute renal failure not associated with trauma. Some of the problems that may arise, partly as a result of these differences, in the management of post-traumatic renal failure are here described, with particular reference to diagnosis and treatment.

Diagnosis

Acute renal failure is usually diagnosed either clinically by the sudden onset of signs of renal damage, of which the chief are oliguria, proteinuria, low urinary specific gravity, and a rising blood-urea level, or histologically by the recognition, either at necropsy or by biopsy, of the characteristic degenerative lesion of acute tubular necrosis in the kidneys.

After head injury or surgical operation the early diagnosis of acute renal failure may be difficult for the following reasons:

(1) Oliguria, proteinuria, a rising blood-urea level, and coincident hypotension are by no means uncommon in patients in whom renal failure does not develop.

(2) Oliguria, although usually the most prominent of the signs of acute renal failure, is absent in a third of the confirmed post-traumatic cases (Taylor and Reid 1957). The diagnosis of acute renal failure may then be delayed until severe uræmia and hyperkalæmia become manifest.

(3) There is no agreed definition of oliguria for diagnostic purposes. Bull et al. (1949) and Sevitt (1956) regard 300 ml. a day as the urinary volume below which there is oliguria, and theoretical support for this is provided by the observations of Coller and Maddock (1935) and McCance et al. (1943) that, in simple deprivation of water, normal renal function may reduce the daily obligatory urinary loss to this volume. Swann and Merrill (1953), however, adopt 400 ml., Lucké (1946), Meroney and Herndon (1954), and Teschan et al. (1955) 500 ml., and Muirhead and Stirman (1952) as much as 1 litre as their limiting volumes.

(4) Even when unequivocal oliguria is present, acute renal failure may occasionally be overlooked in unconscious patients who, after head injury, are incontinent of urine and cannot have their urinary output accurately measured.

It would be useful to have a clear-cut means of avoiding these difficulties in diagnosing acute renal failure. In an attempt to obtain this, acute renal failure has been defined as occurring when the blood-urea level rises above 100 mg. per 100 ml. and the urine-urea level falls below 2 g. per 100 ml. in patients without previous renal disease. The experimental basis for such a definition rests upon the urea concentration test of MacLean and de Wesselow (1920), in which it is established that, after oral ingestion of urea to provide a urea load, the level of urea in the urine should exceed 2 g. per 100 ml. if the kidneys are undamaged.

Experience with patients after head injury (Higgins et al. 1954) and with postoperative patients has amply reinforced the validity and usefulness of this definition. In practice patients in whom the blood-urea level is higher than 100 mg. per 100 ml. and the urine-urea level higher than 2 g. per 100 ml. always respond therapeutically to fairly simple adjustments of diet and fluid intake and show no sign of intrinsic renal damage. When, however, the urine-urea level falls below 2 g. per 100 ml., other evidence of renal damage—e.g., proteinuria, hæmaturia, and low urinary specific gravity—is often present. Whatever dietary and fluid adjustments are then made, the blood-urea level usually continues to rise and with it the serum-potassium level, while the plasma-bicarbonate level falls, until recovery is manifested by a rise of the urine-urea level above 2 g. per 100 ml. or by profuse diuresis.

The diagnosis of acute renal failure can thus be made speedily and without recourse to measurement and interpretation of the urinary volume. Satisfactory therapy can then be swiftly begun: when there is renal failure, fluid intake is strictly controlled and a non-protein diet begun; when there is extrarenal uræmia (urine-urea level above 2 g. per 100 ml.), fluid intake can safely be increased to promote increased urinary flow.

Of 24 fatal cases of acute renal failure defined in this way (Taylor and Reid 1956), only 1 did not show at necropsy the renal changes characteristic of acute tubular necrosis or the "prenecrotic" changes described by Brun (1954). Acute renal failure was diagnosed in 10 of these 24 patients when there was no oliguria (less than 300 ml. of urine daily).

It is therefore recommended that, after major operation or head injury, the blood-urea level should be estimated on the second or third day; and, if it is above 100 mg. per 100 ml., the urine-urea level also should be ascertained. This definition of acute renal failure applies equally to the diagnosis of acute renal failure in other circumstances—e.g., after mismatched blood-transfusion and antepartum hæmorrhage.

The practical usefulness of this definition of acute renal failure is illustrated by the following case-reports.

Case-reports

Case 1.—A woman, aged 49, previously in excellent health, was admitted with acute appendicitis. Operation revealed a perforated appendix with an appendix abscess but no diffuse peritonitis. During the next eight days the patient was treated with streptomycin 0·5 g. twice daily, and apart from an evening pyrexia of 99–101°F her postoperative course was uneventful. On the eighth postoperative day she began to get up. On the morning of the ninth day she vomited and collapsed, her pulse was unrecordable, her abdomen was distended, and there were no bowel sounds. About 2 litres of brown stomach contents were vomited and aspirated. There was slight œdema. Paralytic ileus was diagnosed. Blood for biochemical analysis was collected within $1^1/_2$ hours of this event and showed (table I) the characteristic picture of renal failure. The blood-urea and serum-potassium levels were raised to 317 mg. per 100 ml. and 7 m.eq. per litre respectively, and the urine-urea level was low (1·2 g. per 100 ml.). On this and the next three days there was oliguria, and large volumes (2–3 litres) of gastric aspirate were removed. Intravenous fluid was given to replace these losses, care being taken to avoid overhydration, and the systolic blood-pressure was maintained at 120 mm. Hg. The patient died on the thirteenth postoperative day. At necropsy the terminal ileum was found adhering to the stump of the appendix and kinked, causing obstruction. The intestine above this was distended. Bronchopneumonia was present, and the kidneys showed characteristic acute tubular necrosis with no evidence of previous renal damage.

TABLE I—BIOCHEMICAL DATA OF CASE 1

Days	1–8	9	10	11	12	13
Urine (ml.)	530 ml. +	230	140	230	230	570
Blood-urea (mg. per 100 ml.)		317	340	374	470	476
Urinary urea (g. per 100 ml.)		1·2	1·2		1·2	1·2
Serum K+ (m.eq. per litre)		7·0		6·6	6·4	6·6
Plasma Cl′ (m.eq. per litre)		76	85	84	85	91
Urinary Cl′ (m.eq. per litre)		17	23		23	49

Comments.—It may be concluded from the already raised blood-urea and lowered urine-urea levels that

the onset of acute renal failure had preceded the collapse of the ninth day, but that, because of the absence of oliguria, it had not been diagnosed. Over the first eight postoperative days the measured daily output of urine averaged 530 ml. and there was a further and unmeasured loss. The lowest and highest measured daily outputs were respectively 280+ ml. and 800 ml. The correct diagnosis was revealed by estimating the blood- and urine-urea levels. If this had been done earlier, perhaps the renal failure would have been diagnosed earlier.

Case 2.—A woman, aged 39, who had previously had three miscarriages, was delivered of her first live child by lower-segment cæsarean section because of uterine inertia, a high fœtal head, a poorly dilated cervix, and fœtal distress. Three days later, after a normal postoperative course, she developed abdominal distension and vomited. Over the next few hours vomiting persisted, bowel sounds diminished, a flatus tube and an enema were unproductive, and her abdominal wound burst. She was given intravenous fluid. Laparotomy revealed a loop of small bowel and a piece of omentum in the abdominal wound, with intestinal obstruction. The latter was relieved and the wound resutured.

The patient's systolic blood-pressure had remained since delivery 95–120 mm. Hg, but her daily output of urine now fell to 400 ml. Next day she developed severe diarrhœa, her output of urine from midnight to noon was only 250 ml., and her blood-urea level had risen to 129 mg. per 100 ml. At this stage it was important to decide, for correct fluid replacement, whether the relatively small output of urine and the raised blood-urea level indicated depletion of water and sodium or acute renal failure. The urine-urea level was 3·7 g. per 100 ml., indicating good renal function; so the fluid intake was increased. The patient's output of urine increased, her blood-urea level fell, and she made a good recovery.

Case 3.—A man, aged 59, who was known to be hypertensive, underwent abdominoperineal resection of a carcinoma of his rectum. His blood-pressure, which had been 190/130 mm. Hg before the operation, fell to 110/70 mm. Hg at the end of the operation despite the infusion of four bottles of blood (2·2 litres) and one of dextran (0·54 litre). During the next ten hours to midnight 0·75 litre of dextran and 0·54 litre of 4% glucose in one-fifth isotonic saline solution were infused, but the blood-pressure, after returning to 170/110 mm. Hg, fell again to 110/70 mm. Hg. The systolic pressure remained 110–140 mm. Hg throughout the next day, despite the infusion of a further 1·1 litres of blood and 1·7 litres of 4% glucose in one-fifth isotonic saline solution. The patient also drank 0·67 litre of water without vomiting. The total output of urine on the day of operation was 170 ml., and on the next day 260 ml. During the morning of the second postoperative day the blood-pressure was slightly higher (systolic 120–150 mm. Hg), but the output of urine was only 110 ml., and the blood-urea level had risen to 106 mg. per 100 ml. The patient was taking fluids well by mouth. In view of the persisting hypotension and oliguria a diagnosis of acute renal failure was considered. However, a urine-urea level of 3·7 g. per litre indicated good renal function and suggested that the raised blood-urea level was extrarenal in origin. There was no evidence of dehydration, but the hæmoglobin concentration was only 81%, and it seemed that the oliguria might be due to simple lack of glomerular filtration because of hypotension. Accordingly a blood-transfusion of 1·1 litres was given, after which the systolic pressure rose from 130 to 200 mm. Hg. The effect on the output of urine was striking, 280 ml. being passed in six hours. Unfortunately the patient's condition suddenly deteriorated further, and he died. Necropsy revealed myocardial fibrosis, almost complete obstruction of the coronary arteries at two points, acute pulmonary œdema, and acute dilatation of the right auricle. The kidneys showed no evidence of acute renal failure.

Comments.—Cases 2 and 3 show that, when clinical circumstances arise which could lead to acute renal failure, the differential diagnosis of extrarenal uræmia may readily be made by combined estimation of blood-urea and urine-urea levels, and that the differentiation is valid, as in case 3, when oliguria results from hypotension.

Differential diagnosis.—Acute postoperative and post-traumatic renal failure must also be differentiated from other coincident renal disease as well as from extra-renal conditions causing azotæmia and oliguria. Chronic affections of the kidney—e.g., chronic nephritis, chronic pyelonephritis, and renal tuberculosis—may be differentiated by previous history, by careful pre-operative studies of renal function, or by preoperative clinical findings, such as polyuria, nocturia, hypertension, and hypertensive retinitis. In patients with head injury and in many acute abdominal emergencies, however, preoperative tests of renal function cannot be made. Should renal failure then supervene, it is often impossible to obtain by history or clinical examination evidence of pre-existing renal disease. Such patients must therefore be treated as cases of acute renal failure, and the true diagnosis may not become apparent until after death. Of 42 cases of renal failure following head injury or operation 11 showed, at necropsy, evidence of previously unidentified renal disease (Taylor and Reid 1957). By renal biopsy it might be possible to make a more precise diagnosis during life (Brun 1954).

Treatment

In all 31 patients conservative treatment of acute renal failure was attempted. Fluid intake was restricted to balance fluid loss, 600–800 ml. a day being allowed for insensible water loss and increased by 200 ml. for each degree of temperature above 100°F. Other extra-renal losses of fluid were measured wherever practicable and replaced with equal volumes of isotonic sodium-chloride solution. When the serum-potassium level reached 6·5 m.eq. per litre, an attempt to reduce it was made by injecting subcutaneously soluble insulin 12 units eight-hourly. When the plasma-bicarbonate level fell below 10 m.eq. per litre it was raised by the intravenous infusion of sodium-lactate solution. In the presence of oliguria doses of antibiotics were greatly reduced.

The provision of a high-calorie non-protein diet was attempted either by mouth or by indwelling pernasal intragastric drip in all the patients except those who had undergone abdominal surgery. The arachis oil/glucose régime of Bull et al. (1949) was usually poorly tolerated, but 1 patient drank it in divided doses three-hourly. In some patients tolerance was improved by running the intragastric drip intermittently for 2–6 hours and disconnecting it for equal periods to facilitate digestion, absorption, and sleep. More recently 50% glucose solution has been used alone or with the addition of 50–100 ml. of double centrifuged cream, and has proved less nauseating. Unconscious patients with head injury have, however, rarely tolerated glucose solutions of greater concentration than 25% without getting diarrhœa.

After abdominal surgery, and in several patients in whom oral feeding had to be abandoned, hypertonic glucose solutions were given intravenously. Solutions stronger than 10% could not be given into the superficial veins of the arm for longer than about twelve hours without blockage; hence the intake of calories by this route was usually inadequate. A drip infusion into the inferior vena cava (Russell et al. 1954) was set up in 9 patients and proved adequate for giving 50% glucose solution for periods as long as eleven days; but at necropsy in 3 of these patients, antemortem thrombosis of the saphenous and external iliac veins was found, extending into the inferior vena cava in 2 patients, despite the addition of heparin to the fluid entering the drip. In one of these cases the drip had been in situ for eleven days and collapse occurred two hours after its removal; but no evidence of pulmonary embolism was found. In another case the drip had only been set up for twenty-four hours before death, yet thrombosis was severe. It is concluded that drip infusions into the inferior

TABLE II—EFFECT ON BLOOD-UREA LEVEL OF ESTABLISHING HIGH-CALORIE NON-PROTEIN DIET IN 31 PATIENTS WITH ACUTE RENAL FAILURE FOLLOWING HEAD INJURY OR SURGICAL OPERATION

Daily intake of calories	Mean daily rise of blood-urea level (mg. per 100 ml.)			
	All patients	Patients with mean daily output of urine (ml.)		
		0–300	300–600	More than 600
Before dietary régime:				
0–300	51	52	52	44
After dietary régime:				
1200–2000	50	64	40	15
More than 2000	45	57	52	16

vena cava are potentially hazardous and should not be used if there is the smallest chance of maintaining a reasonable intake of fluid and at least 800 calories a day by mouth or by stomach-tube, or through smaller veins—e.g., the saphenous and cephalic veins.

Results of Treatment

Survival.—26 patients died and 5 survived. The survivors comprised 2 of 9 patients who had undergone abdominal operation, 1 of 5 neurosurgical patients, and 2 of 2 patients who had had gynæcological operations. Of 12 patients with head injury none survived. If those patients are excluded in whom renal failure was not thought to have contributed to death, the mortality is reduced to 15 out of 20. In 8 patients in whom acute renal failure was the prime cause of death, and in whom a satisfactory therapeutic régime had been established, it was particularly disappointing that death should have taken place between the fifth and thirteenth days, before there was time for renal function to recover. In these patients the terminal blood-urea levels were 349–670 mg. per 100 ml. and serum-potassium levels 6·7–9·8 m.eq. per litre.

Rate of rise of blood-urea level.—The mean rate of rise of blood-urea level before the establishment of a therapeutic régime was 51 mg. per 100 ml. daily, and afterwards 47 mg. per 100 ml. daily—a difference which is not significant (table II). Thus non-protein diets of at least 1200 calories daily did not diminish endogenous protein katabolism significantly. In table II the mean rates of rise of blood-urea level at different urine flows, before and after establishment of the dietary régime, are also given. At low urine flows the régime did not affect the rate of rise, but at higher urine flows the rate of rise in the treated group was much diminished—a finding for which there is no good explanation. Despite conservative treatment, therefore, the blood-urea level continued to rise rapidly. In 8 of 11 patients with blood-urea levels of 300 mg. per 100 ml. this level was reached as early as the fourth to sixth day of acute renal failure. Levels of 400 mg. per 100 ml. were reached as early as the fifth to seventh days in 5 of 8 patients.

Serum-potassium level.—Like the blood-urea level, the serum-potassium level often rose rapidly, and an adequate dietary intake did not diminish the rate of this rise, which was 0·2–1·1 m.eq. (mean 0·6 m.eq.) daily before and after the dietary régime had been established.

Effect of insulin.—Insulin was given to 8 patients. In 3 death supervened before the effect could be judged, but in the 5 others the administration of insulin was followed either by a fall in serum-potassium level or by a halt in its rise. Thus in 1 patient already reported elsewhere (Roux 1956) the serum-potassium level during four days' insulin therapy fell from 7·4 to 6·8 m.eq. per litre. Had the previous mean rise continued, the expected serum-potassium level would have been 8·6 m.eq. per litre. In another patient the rate of rise was cut down from 0·5 to 0·1 m.eq. a day. Such effects were often transitory, and after an interval of about four days the previous rate of increase returned. The impression was gained that insulin may be a useful form of therapy in that it may postpone the rise of the serum-potassium level to toxic levels for about two days and thus increase the time available for recovery of renal function.

Discussion

Factors Affecting Survival

Deaths from initial injury and from complications other than renal failure were two of the factors responsible for the high mortality in the whole group. Among the patients in whom renal failure was the principal clinical disorder mortality was still high. The chief factor here was probably the failure of the conservative régimes to delay the advent of high blood-urea and serum-potassium levels until renal function could recover adequately.

The most likely cause of the rapid rise of the blood-urea level is the obligatory katabolism of protein which follows trauma (Cuthbertson 1932). Thus on one day one of the patients who eventually recovered excreted 1960 ml. of urine containing 1·4 g. of urea per 100 ml., a total output of about 27·5 g. of urea; his blood-urea level rose by 21 mg. per 100 ml. during these twenty-four hours, yet he had received 550 g. of glucose intravenously. The mean daily rate of rise of blood-urea, 51 mg. per 100 ml., in the whole group compares favourably with a mean rise of 50 mg. of non-protein nitrogen per 100 ml. daily cited by Teschan et al. (1955) for Korean battle-casualties with acute renal failure. The mean rate of rise of serum-potassium level, 0·6 m.eq. per litre daily, is similar to that of 0·7 m.eq. per litre daily cited by the same workers. In contrast to these traumatic cases, however, 10 patients with acute renal failure of non-traumatic origin had a mean rise of blood-urea level of only 30 mg. per 100 ml. a day when maintained on comparable conservative régimes, and Bull et al. (1949) found in non-traumatic cases an even smaller increase of 8–26 mg. per 100 ml. a day. Of the 10 non-traumatic patients 6 lived, contrasting sharply with the mortality of renal failure following head injury or operation. Of the 11 patients reported by Bull et al. (1949) 7 lived.

It may be concluded that, when renal failure follows head injury or surgical operation, conservative therapeutic régimes are generally ineffective, in that death takes place with high blood-urea and serum-potassium levels before renal function has time to recover. In such patients there seems to be a real need for an artificial kidney to keep the patient alive until he recovers from renal failure and for a method of reducing obligatory katabolism of protein. Faced with a somewhat similar problem, Smith et al. (1955) report a fall from 80 to 53% in the overall mortality-rate of post-traumatic renal failure among Korean battle-casualties after the establishment of a Renal Insufficiency Centre using an artificial kidney. They also found that the average survival time of fatal cases was almost doubled, from 6·8 days to 12·4 days, as a result of treatment with the artificial kidney. The poor results achieved in the present series of cases of acute renal failure following civilian head injury or operation effectively underline the conclusion of Smith et al. (1955):

> "Experience with the relatively benign nature of acute renal failure in uninjured and uninfected patients should not be misapplied to those who have developed renal insufficiency in the course of extensive surgical or accidental trauma."

Acute Renal Failure with and without Trauma

It seems logical, from the observations described here and previously (Taylor and Reid 1956, 1957) and from the

work of Bull et al. (1949, 1950) and Teschan et al. (1955), to distinguish between acute renal failure following trauma, such as head injury and operation, and acute renal failure arising from relatively non-traumatic events, such as mismatched transfusion and abortion. The traumatic cases have a mortality of more than 50% and often more than 80%, they respond poorly to conservative dietary régimes, they have a relatively large mean daily rise of blood-urea level, and often they have a high urinary specific gravity and a high plasma/urine chloride ratio. In non-traumatic cases, on the other hand, the clinical condition is usually good (apart from renal failure), the mortality is 40% or less, there is a good response to conservative dietary régimes, the mean daily rise of blood-urea level is slight, and usually the urinary specific gravity and the plasma/urine chloride ratio are low.

High-calorie Régimes in Acute Renal Failure after Trauma

The problem of how to administer a high-calorie non-protein diet to patients with acute renal failure has stimulated the ingenuity of clinicians for years, and several régimes have been devised: arachis oil and glucose, hypertonic oral glucose solutions, 50% glucose via cardiac catheter, and 50% glucose by drip infusion into the inferior vena cava. The evidence presented here raises the question of the extent to which such measures are necessary or desirable in patients who have received a head injury or undergone an operation. The principal complication of the oral régimes is that they may cause vomiting and/or diarrhœa, which are not only unpleasant but also complicate the problem of fluid therapy in that a loss of fluid, often of unknown volume and composition, must be made good.

The principal complication of intravenous hypertonic glucose solutions is venous thrombosis. In smaller veins the hazard thus introduced is small, but it seems inadvisable to risk thrombosis of the inferior vena cava if it can be avoided. The addition of anticoagulants—e.g., heparin—to the drip does not always prevent thrombosis, and large amounts of anticoagulant cannot always be safely given to patients after head injury and abdominal or neurosurgical operations. It therefore seems logical not to persevere with measures designed to give high-calorie intakes if complications are likely to ensue and if no appreciable benefit is likely to accrue to the patient.

Cases of acute renal failure occurring more recently have been treated with the calculated volumes of oral glucose solutions of 10–25% concentration, or intravenous solutions of 5–20% administered via ordinary drip-needle or by polyethylene catheter inserted a few inches along the cephalic, basilic, long saphenous, or short saphenous veins. The maximal caloric provision is made that is compatible with the avoidance of complications, provided that a minimal intake of 800–1000 calories is achieved. Drip infusion into the inferior vena cava has largely been abandoned. So far patients appear to have done at least as well as when given higher caloric diets.

It should be emphasised that the arguments stated above do not necessarily hold for acute renal failure arising from events other than trauma and surgical operation, where obligatory katabolism of proteins may not be present, and where endogenous katabolism of proteins might be diminished by a high-calorie non-protein régime. Several workers—e.g., Gamble (1947) and Oard and Walker (1955)—deny that amounts of carbohydrate greater than 100 g. a day spare protein; but, even if this is true, it is advisable (Bull 1955) to give larger intakes than 100 g. to achieve intracellular deposition of potassium ions, when insulin is being injected. For this reason it is suggested that, even in post-traumatic renal failure, the daily carbohydrate intake should not be reduced below 200 g. a day, but that attempts to give more than this are probably misplaced.

Summary

Acute renal failure may be diagnosed if the blood-urea level is above 100 mg. per 100 ml. and the urine-urea level falls below 2 g. per 100 ml. in patients without previous renal disease.

Such a definition prevents delay in diagnosing patients who develop renal failure in the absence of oliguria, or in whom the output of urine cannot be satisfactorily measured because of incontinence, as well as providing a rapid means of recognising extrarenal uræmia, for in such patients the urine-urea level is above 2 g. per 100 ml.

Of 42 patients with renal failure diagnosed in this way after head injury or operation 31 had acute renal failure as defined above, but 11 were found at necropsy to have had renal damage which had not been recognised clinically during life. Of the patients with acute renal failure 5 survived. Of the 26 fatal cases 24 came to necropsy, and 23 of these showed recognisable histological features associated with acute renal failure, confirming the validity of the diagnostic method.

Non-protein diets providing 1200–2500 calories a day did not halt the rise of the blood-urea level or of the serum-potassium level in 31 patients in whom acute renal failure followed head injury or operation. It is suggested that these effects arise from the obligatory katabolism of protein after trauma.

Injections of soluble insulin had a definite but temporary effect on the serum-potassium level, causing a fall or halting its rise.

Drips into the inferior vena cava sometimes caused severe thrombosis of the saphenous and external iliac veins and of the inferior vena cava, and must be regarded as potentially hazardous.

The therapeutic limitations of conservative management of post-traumatic renal failure are discussed. It is suggested that attempts to provide high-calorie non-protein diets are probably misplaced, and that a significant decrease in mortality is only likely to come about through the early use of an artificial kidney.

I wish to thank the surgeons and physicians of the Radcliffe Infirmary for access to patients and for permission to cite the records of patients under their care, and the staff of the Department of Clinical Biochemistry by whom many of the estimations were made. I am especially grateful to Dr. J. V. O. Reid, who undertook the histological examination of the kidneys of these patients.

REFERENCES

Brun, C. (1954) Acute Anuria. Copenhagen.
Bull, G. M. (1955) *Lancet*, i, 777.
— Jockes, A. M., Lowe, K. G. (1949) *Ibid*, ii, 229.
— — — (1950) *Clin. Sci.* 9, 379.
Coller, F. A., Maddock, W. G. (1935) *Ann. Surg.* 102, 947.
Cuthbertson, D. P. (1932) *Quart. J. Med.* 1, 233.
Gamble, J. L. (1947) *Harvey Lect.* 42, 247.
Higgins, G., Lewin, W., O'Brien, J. R. P., Taylor, W. H. (1954) *Lancet*, i, 61.
Lucké, B. (1946) *Milit. Surg.* 99, 371.
McCance, R. A., Young, W. F., Black, D. A. K. (1943) *J. Physiol.* 102, 415.
MacLean, H., de Wesselow, O. L. V. (1920) *Brit. J. exp. Path.* 1, 53.
Meroney, W. H., Herndon, R. F. jun. (1954) *J. Amer. med. Ass.* 155, 877.
Muirhead, E. E., Stirman, J. A. (1952) *Surgery*, 32, 43.
Oard, H. C., Walker, G. I. jun. (1955) *Amer. J. Med.* 18, 199.
Roux, J. P. (1956) *Proc. R. Soc. Med.* 49, 90.
Russell, C. S., Dewhurst, C. J., Brace, J. C. (1954) *Lancet*, i, 902.
Sevitt, S. (1956) *J. clin. Path.* 9, 12.
Smith, L. H., Post, R. S., Teschan, P. E., Abernathy, R. S., Davis, J. H., Gray, D. M., Howard, J. M., Johnson, K. E., Klopp, E., Mundy, R. L., O'Meara, M. P., Rush, B. F. (1955) *Amer. J. Med.* 18, 187.
Swann, R. C., Merrill, J. P. (1953) *Medicine, Baltimore*, 32, 215.
Taylor, W. H., Reid, J. V. O. (1956) *J. clin. Path.* 9, 184.
— — (1957) To be published.
Teschan, P. E., Post, R. S., Smith, L. H., Abernathy, R. S., Davis, J. H., Gray, D. M., Howard, J. M., Johnson, K. E., Klopp, E., Mundy, R. L., O'Meara, M. P., Rush, B. F. (1955) *Amer. J. Med.* 18, 172.

HISTOPLASMIN TESTING IN DIFFERENT GEOGRAPHIC AREAS*

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A MAP of the world showing the localities where histoplasmin testing surveys have been made and the percentage of reactions reported as positive in each locality (Edwards and Kiær 1956) shows (fig. 1) that sensitivity to histoplasmin is prevalent in the Americas, particularly in the east-central part of the United States, the Central American countries, and some regions of South America. Europe seems to be free from histoplasmosis. So far as can be judged from the few scattered testing surveys reported from Africa and Asia, low-prevalence endemic areas may exist in east-central Africa and perhaps also in the Union of South Africa and in some parts of south-east Asia—Indonesia, the Philippines, and Viet Nam.

The map was compiled from data in which the percentages of positive reactions were reported in the traditional form as reactions measuring more than a specified size (usually 5 mm.). As with tuberculin reactions, however, the percentage of histoplasmin reactions reported as positive may, in some areas, give a misleading picture of the prevalence of infection with histoplasma. There is ample evidence that histoplasmal infection produces sensitivity to histoplasmin, but how sure can we be that all histoplasmin sensitivity means histoplasmal infection? Experiments on animals and studies on man have shown that skin sensitivity to histoplasmin may result from infection with other fungi (Emmons et al. 1945, Howell 1947, Smith et al. 1949). For example, persons infected with *Coccidioides immitis* often react to histoplasmin as well as to coccidioidin.

* Read at the Symposium on Fungous Diseases and Their Treatment sponsored by the University of London (British Postgraduate Medical Federation) and held at the Institute of Diseases of the Chest, Brompton Hospital, London, on July 22–24, 1957.

It is also suspected that histoplasmin reactions are sometimes due to infection with other fungi. To define the geographic distribution and prevalence of histoplasmal infection it is therefore necessary to distinguish between histoplasmin sensitivity caused by infection with histoplasma (specific sensitivity) and the sensitivity caused by infection with some other fungus (non-specific sensitivity). I suggest here one way to approach the problem of trying to distinguish between specific and non-specific sensitivity to histoplasmin in human populations.

Results of testing in different geographic areas have revealed striking variations in the pattern of response to histoplasmin (Edwards et al. 1956, Edwards and Palmer 1957, Palmer et al. 1957):

One characteristic pattern is found in areas where histoplasmosis is prevalent, as shown by clinical cases of the disease and by high frequencies of pulmonary infiltrations and calcifications in persons who react to histoplasmin but not to tuberculin.

Another pattern characterises the reactions of an essentially negative population, where neither histoplasmosis nor coccidioidomycosis nor any other sensitising agent appears to be present.

Still another pattern is found in areas where coccidioidomycosis or some other cross-sensitising infection is prevalent but histoplasmosis is infrequent or absent.

These patterns may be illustrated by material collected by the U.S. Public Health Service during the two-year period from September, 1949, to September, 1951. Almost 100,000 young men from all parts of the country were radiographed and tested with three antigens —histoplasmin, coccidioidin, and tuberculin—as they arrived at the San Diego Navy Training Center, California, to begin their period of military service.

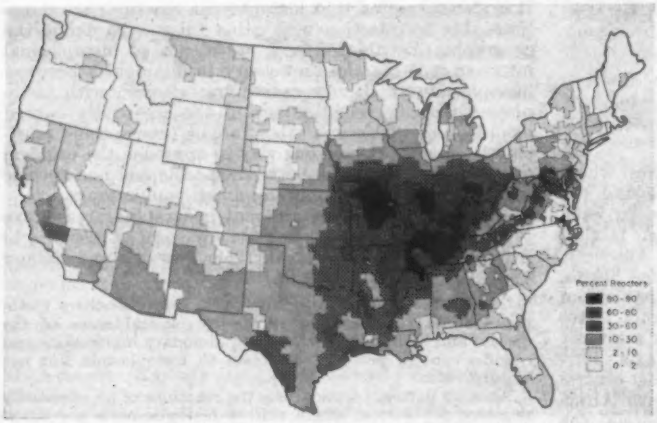
Most of the histoplasmin tests were given by intradermal injection of 0·1 ml. of a 2:1000 dilution of the product identified as H-40, prepared by the Public Health Service; a small proportion were given with an equivalent dosage of one of several other products, including H-42.

Coccidioidin C-24, prepared by Dr. Charles E. Smith, and the international standard PPD-S tuberculin, prepared by Dr. Florence Seibert, were used for the other two tests.

The testing was done by a team of hospital corpsmen who had been trained to use uniform techniques and to measure and record the size of the induration of the reactions. They

(Reproduced with permission from Edwards and Kiær. *Amer. J. trop. Med. Hyg.* 1956, 5, 235

Fig. 1—Percentages of histoplasmin reactions reported as positive from different parts of the world.



(Reproduced with permission from Manos et al. *Dis. chest*, 1956, **29**, 649.)

Fig. 2—Prevalence of histoplasmin sensitivity in young adults in U.S.A.

were told not to try to classify any reaction as positive or negative.

Results for nearly 40,000 white men, aged 17–21, who had lived all their lives in their home counties and could therefore be classified as lifetime one-county residents, were used in studying the response to histoplasmin in different geographic areas throughout the country. We have every reason to believe that differences in the pattern of response from one area to another can be attributed to geographic differences and not to some kind of bias or observer error. The testing was done with a standardised histoplasmin product by one team at one place; and, as recruits came into the training centre from all over the country each month, any systematic variations in technique with time should be randomly distributed throughout the study population. Further details about the study and some of the results given here have been reported previously (Manos et al. 1956, Edwards and Palmer 1957, Palmer et al. 1957).

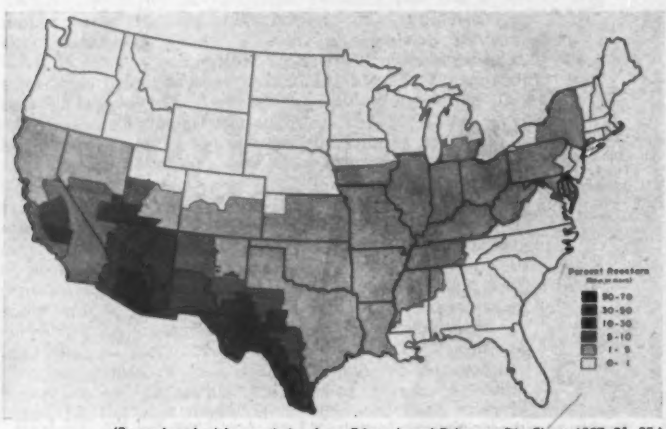
In the U.S.A. histoplasmin sensitivity (fig. 2) is highly prevalent in the east-central area, extending roughly from the Mississippi Valley in the west to the Appalachian Mountains in the east, and from the Great Lakes in the north to the Gulf of Mexico in the south. In some localities within that area more than 80% of the young adults have histoplasmin reactions measuring 5 mm. or more. Clinical cases of histoplasmosis are diagnosed frequently in that area, and subclinical cases with either benign pulmonary infiltrations or calcified residuals are very common. The area is endemic for histoplasmosis. Most of the eastern coast-line and the entire north-west are essentially free from histoplasmosis. But in the south-west, where coccidioidomycosis is endemic, the prevalence of histoplasmin reactions measuring 5 mm. or more exceeds 30% in some areas.

Fig. 3 shows the percentage of coccidioidin reactions measuring 5 mm. or more throughout the U.S.A. The high prevalence area is sharply limited to southern California, Arizona, New Mexico, and the western half of Texas. Coccidioidomycosis is endemic in the south-west, as shown by large numbers of clinical and subclinical cases of the disease arising locally. From the middle of Texas and eastward across the histoplasmal endemic area the prevalence of coccidioidin sensitivity is well below 5%; and it is negligible in the north-west and south-east.

In interpreting the results of testing with histoplasmin the pattern of response shown by the sizes of the reactions can be expected to indicate whether or not we are dealing with specific sensitivity, because we know that reactions caused by infection with the homologous organism are generally larger than reactions caused by infection with some heterologous organism (Emmons et al. 1945, Howell 1947, Smith et al. 1949, Edwards and Palmer 1957). Histoplasmin reactions in persons infected with histoplasma are larger in average size than, for example, histoplasmin reactions in persons infected with coccidioides. In attempting to distinguish between specific and non-specific histoplasmin sensitivity we have therefore analysed our material in terms of the sizes of the reactions, and will present the results in the form of percentage frequency-distributions of the sizes of the reactions.

Frequency-distributions by size of reactions to histoplasmin in the histoplasmosis endemic area are given in fig. 4. The results are for recruits from nine east-central states (Arkansas, Illinois, Indiana, Iowa, Kentucky, Mississippi, Ohio, Tennessee, and Wisconsin), where most of the reactions to histoplasmin can probably be ascribed to specific infection with histoplasma.† Groups of counties within the nine states have been combined according to the prevalence of histoplasmin sensitivity: counties with a prevalence of more than 70% were combined and called area D; counties with 50–70% area E; with 30–50% area F; and with 10–30% area G.

The sizes of the reactions for each area are plotted along the horizontal axis, and the percentages of reactions of specified sizes are shown by the height of the corresponding column. The frequency of reactions measuring 4 mm. or more in area D is about 83%, in area E about 67%, in area F about 45%, and in area G about 18%. In each instance the reactions distribute themselves into two groups: one at the left composed of 0, 1, 2, and some 3 and 4 mm. reactions; the other towards the right, in a form resembling the normal probability frequency curve, with reactions measuring from 2, 3, and 4 mm. to more than 25 mm. We can assume that the population in each area is composed of two groups of persons, some



(Reproduced with permission from Edwards and Palmer. *Dis Chest*, 1957, **31**, 35.)

Fig. 3—Prevalence of coccidioidin sensitivity in young adults in U.S.A.

† Persons with tuberculin reactions of 8 mm. or more or whose radiograph was not read by both roentgenologists have been excluded.

who have been infected with histoplasma and some who have not, and we interpret the two groups of reactions in each distribution as representing the infected and the uninfected groups in the population. Persons with 2, 3, 4, and perhaps 5 mm. reactions, in the range where the two groups overlap, represent a mixture of some infected and some uninfected. Most of the infected, however, have fairly large reactions averaging 10–11 mm. in diameter; and most of the uninfected have no measurable induration.

Implications may be drawn from these results about the nature of specific sensitivity to histoplasmin: (1) the positive (specific) reactions are distributed fairly symmetrically around a central value, which represents the mean or average size reaction; and (2) the average size of specific reactions does not vary with the prevalence of infection, whether it is as high as 83% or as low as 18%. The only important difference between the four histograms is the relative proportions of large (positive) reactions and negative reactions. From this it follows that repeated infection probably has little effect on the size of the reaction, because repeated infection must occur more often in area D, where the prevalence is high, than in area G, where it is low. Moreover there seems to be little if any indication of a significant fading or gradual disappearance of histoplasmin sensitivity in the absence of reinfection; because, if sensitivity tended to fade, we would expect to find a higher proportion of small (fading) reactions in area G than in area D, and we see no evidence of that. It seems that the 5 mm. criterion is too high for estimating the percentage of positives in this area, because many of the 5, 4, and even 3 and 2 mm. reactions clearly belong to the positive group, and the 5 mm. criterion would thus underestimate the percentage of infected persons in the population.

In an essentially negative population, on the other hand, the 5 mm. criterion would overestimate the

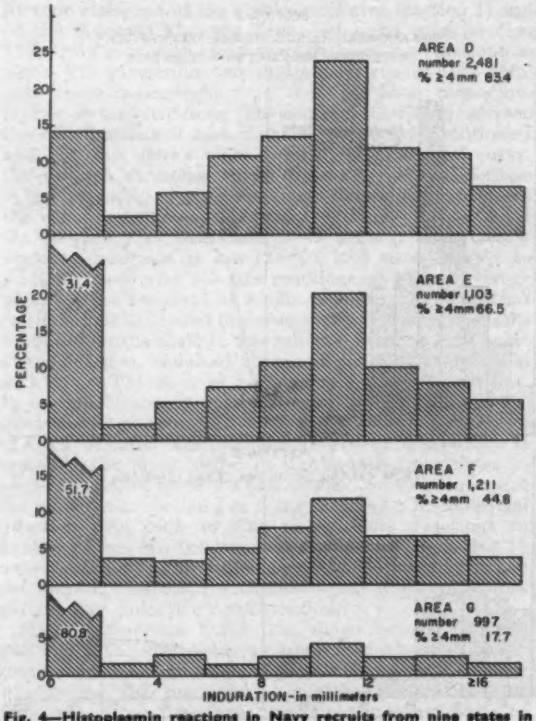


Fig. 4—Histoplasmin reactions in Navy recruits from nine states in east-central part of U.S.A., subdivided according to prevalence of sensitivity

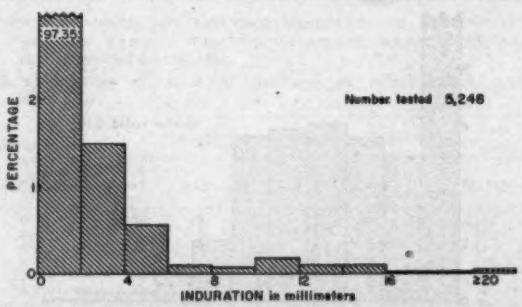


Fig. 5—Histoplasmin reactions in Navy recruits from five states in north-western part of U.S.A.

percentage of infected persons. In the results obtained in 5248 lifetime residents of Washington, Oregon, Idaho, Montana, and Wyoming, more than 99% of the reactions belong to the negative group at the left-hand part of the scale (fig. 5). Many of the 4 and 5 mm. reactions, and even some of the 6 and 7 mm. reactions, must in this locality, we believe, be interpreted as negative. The very small group of reactions centering around 10–11 mm. represents the positive group, which may be most efficiently separated from the negatives at about the 7 or 8 mm. level. Arbitrarily to make the customary separation at 5 mm. would lead here to overestimating, by about 100%, the proportion of specific reactors.

A very different pattern of response is found in the south-west, where coccidioides is highly prevalent. Histoplasmin reactions in that area (fig. 6) form a step-like distribution from a high frequency at 0–1 mm. to successively lower frequencies along the scale towards the larger sizes. The main difference between this distribution and the one for the north-west (fig. 5) is the relative increase in the proportion of small reactions: a great many more persons living in the south-west react with 3, 4, 5, up to 9 and 10 mm. than in the north-

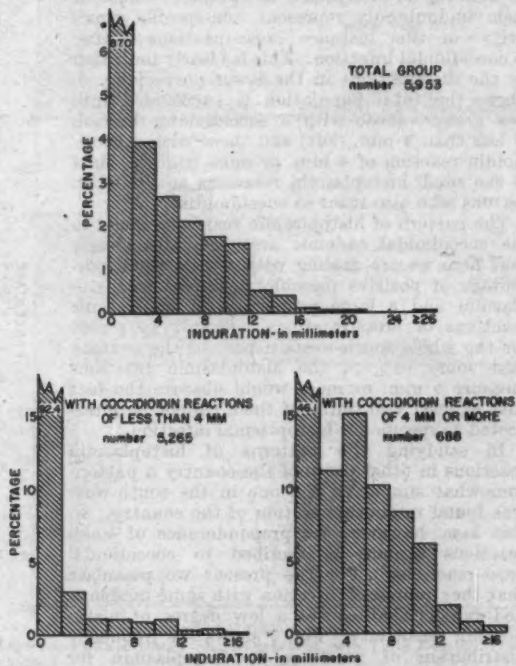


Fig. 6—Histoplasmin reactions in Navy recruits from four states in south-western part of U.S.A.

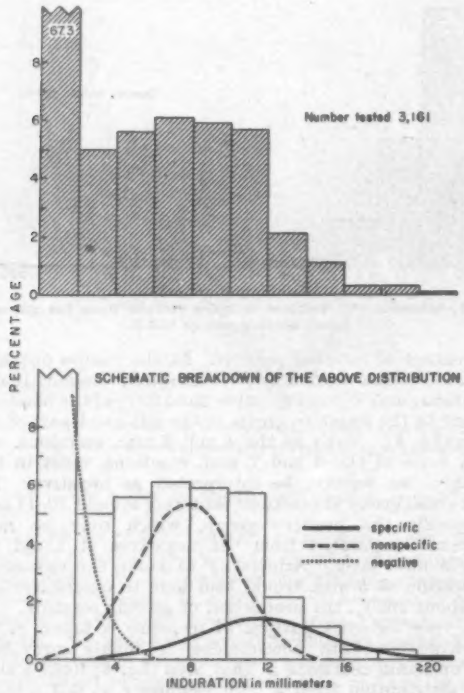


Fig. 7—Histoplasmin reactions in Navy recruits from Kansas, Oklahoma, Texas, and Louisiana.

west. The small proportion of large reactions probably represents specific sensitivity to histoplasmin, but the mass of small reactions cannot, we believe, be interpreted as specific. Most of them undoubtedly represent non-specific sensitivity—in this instance cross-reactions—owing to coccidioidal infection. This is clearly indicated by the distributions in the lower part of fig. 6, where the total population is subdivided into two groups, those with a coccidioidin reaction of less than 4 mm. (left) and those with a coccidioidin reaction of 4 mm. or more (right). Most of the small histoplasmin reactions are found in persons who also react to coccidioidin.

The pattern of histoplasmin reactions found in the coccidioidal endemic area indicates clearly that here we are dealing with only a small percentage of positive (specific) reactions to histoplasmin and a large proportion of non-specific reactions or cross-reactions. Simply to report for the whole south-western part of the country that some 10% of the histoplasmin reactions measure 5 mm. or more would obscure the fact that at least two-thirds of them cannot be interpreted as specific for histoplasmal infection.

In studying the patterns of histoplasmin reactions in other parts of the country a pattern somewhat similar to the one in the south-west was found in another section of the country. In this case, however, the preponderance of small reactions cannot be ascribed to coccidioidal cross-reactions. For the present we postulate that they represent infection with some unidentified fungus that causes a low degree of histoplasmin sensitivity. Fig. 7 shows the frequency distribution of reactions to histoplasmin for 3161 lifetime residents of parts of four adjacent states: western Kansas, western Oklahoma, eastern Texas, and western Louisiana, a section lying east of the coccidioidal endemic area and on the western fringe of the histoplasmal endemic area. (Persons with tuberculin reactions of 1 mm. or more, or whose radiograph was not read by both readers, have been excluded.) Some, perhaps most, of the large reactions can be interpreted as specific for histoplasmal infection; but the small reactions filling in the range between specific and negative reactions undoubtedly represent sensitisation by some other infection. Thus, although nearly 30% of the reactions measure 4 mm. or more, about two-thirds of them are interpreted as being non-specific. They cannot be attributed to coccidioidal infection, because the population in this area is essentially free from coccidioidin sensitivity (cf. fig. 3). Nor can they be attributed to histoplasmal infection, because the pattern of the distribution is very different from that found in the histoplasmal endemic area (cf. fig. 4); it is lopsided, because of a high frequency of small reactions measuring less than 12 mm. in diameter. A similar distribution of histoplasmin reactions, with a relatively high frequency of small (5–9 mm.) reactions, was found in residents of east-central Texas by Furcolow et al. 1955.

Additional evidence that some histoplasmin reactions, particularly the smaller ones, may not be specific for histoplasmal infection was obtained by studying the relation between pulmonary calcifications and size of reactions. We know that there is a high degree of correlation between specific histoplasmin sensitivity and pulmonary calcifications (Palmer 1945); therefore, if histoplasmin sensitivity is associated with a very low frequency of calcifications in some areas, we add to the evidence that at least some of the reactions are not caused by histoplasmal infection. Photofluorograms were taken at the time of the testing and read independently by two roentgenologists, who indicated whether they saw

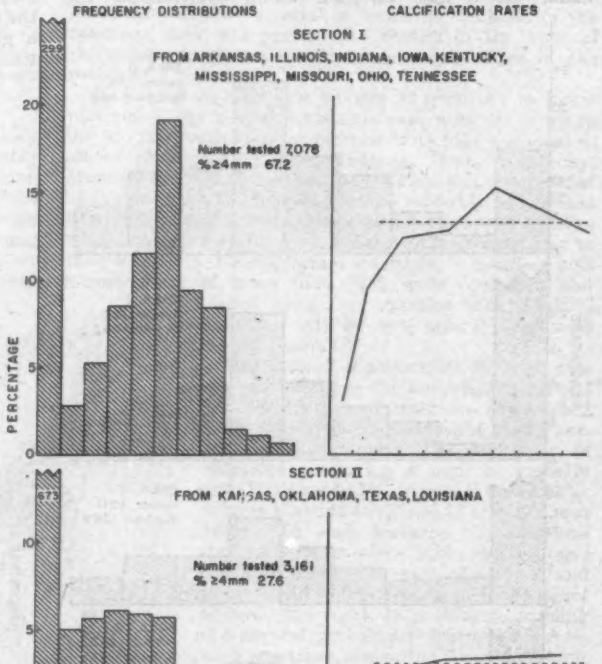


Fig. 8—Frequency histograms and calcification-rates, by size of reaction to histoplasmin, for Navy recruits from two different areas of U.S.A.

TABLE I—DATA FOR LIFETIME RESIDENTS OF SECTION I: ARKANSAS, ILLINOIS, INDIANA, IOWA, KENTUCKY, MISSISSIPPI, MISSOURI, OHIO, AND TENNESSEE

A. Correlation of sizes of reactions to histoplasmin and tuberculin:

Histoplasmin reaction (mm. induration)	Tuberculin reaction (mm. induration)						
	0–1	2–3	4–7	8–11	12–15	16 or more	Total
0–1	2270	17	39	92	76	86	2580
2–3	218	1	7	5	1	13	245
4–7	1017	6	29	37	38	50	1177
8–11	2257	12	44	73	81	111	2578
12–15	1300	7	12	28	40	70	1457
16 or more	383	5	5	4	8	15	420
Total	7445	48	136	239	244	345	8457

B. No. of radiographs read by both roentgenologists and no. with calcifications, according to size of reaction to histoplasmin, for recruits with no reaction (induration zero) to tuberculin:

Histoplasmin reaction (mm. induration)	No. tested	No. of films read by both roentgenologists	No. of films showing calcifications
0–1	2270	2117 (*93·3%*)	64 (*3·0%*)
2–3	218	200 (*91·7%*)	19 (*9·5%*)
4–7	1017	968 (*95·2%*)	120 (*12·4%*)
8–11	2257	2169 (*96·1%*)	278 (*12·8%*)
12–15	1300	1254 (*96·5%*)	190 (*15·2%*)
16 or more	383	370 (*96·6%*)	47 (*12·7%*)
Total	7445	7078 (*95·1%*)	718 (*10·1%*)

TABLE II—DATA FOR LIFETIME RESIDENTS OF SECTION II: WESTERN KANSAS, WESTERN OKLAHOMA, EASTERN TEXAS, AND WESTERN LOUISIANA

A. Correlation of sizes of reactions to histoplasmin and tuberculin:

Histoplasmin reaction (mm. induration)	Tuberculin reaction (mm. induration)						
	0–1	2–3	4–7	8–11	12–15	16 or more	Total
0–1	2220	26	34	41	38	43	2402
2–3	165	5	4	2	2	4	182
4–7	393	2	9	5	2	5	416
8–11	384	4	4	16	7	5	420
12–15	105	2	4	2	1	3	117
16 or more	36	0	0	0	1	0	37
Total	3303	39	55	66	51	60	3574

B. No. of radiographs read by both roentgenologists and no. with calcifications, according to size of reaction to histoplasmin, for recruits with no reaction (induration zero) to tuberculin:

Histoplasmin reaction (mm. induration)	No. tested	No. of films read by both roentgenologists	No. of films showing calcifications
0–1	2220	2128 (*95·9%*)	7 (*0·3%*)
2–3	165	158 (*95·8%*)	4 (*2·5%*)
4–7	393	370 (*94·1%*)	10 (*2·7%*)
8–11	384	368 (*95·8%*)	12 (*3·3%*)
12–15	105	102 (*97·1%*)	4 (*3·9%*)
16 or more	36	35 (*97·2%*)	1 (*2·9%*)
Total	3303	3161 (*95·7%*)	38 (*1·2%*)

definite calcification, possible calcification, or no calcification in each film. In analysing the material a film was considered to show pulmonary calcification if one roentgenologist read it as showing definite calcification and the other read it as either definite or possible calcification.

Results are given in fig. 8 and tables I and II for lifetime residents of the east-central area (section I) and of the Kansas-Oklahoma-Texas-Louisiana area (section II). Only men with unequivocally negative reactions to the 5 TU tuberculin test (induration reported as zero) and whose radiographs were read by both roentgenologists are included here. The contrast is striking between the distributions of histoplasmin reactions for sections I and II: one shows a characteristically bimodal curve, the other a unimodal curve due to a relative increase in the frequency of small reactions. The contrast between the calcification-rates is equally striking. In section I the frequency of calcifications in persons with clearly negative reactions is low (3·0%), and rises sharply to 9·5% for those with 2–3 mm. reactions, and to an average of 13·3% for reactions of 4 mm. or more. The fact that calcifications are found in persons with 0–1 mm. reactions probably means that, in the endemic area, at least some of the 0–1 mm. reactions represent specific histoplasmal infection. The dose of histoplasmin may be too low. In section II the frequency is very low in the negative reactors and rises only to 3·1% in persons with reactions of 4 mm. or more. The histoplasmin reactions in section II must, in the main, differ in significance from those in section I. And, since we can almost certainly interpret the reactions in section I as being specific for histoplasmal infection, the bulk of the histoplasmin reactions in section II are, we believe, non-specific reactions due to sensitisation by some other agent whose identity is not yet known. Infection with that agent apparently does not produce pulmonary calcification.

Material from the U.S.A. has shown several different patterns in the sizes of histoplasmin reactions in different geographic areas and how the patterns provide a basis for interpreting the reactions as specific, non-specific, or negative. Similar patterns are found in other parts of the world as well. Frequency-distributions are given in fig. 9 for histoplasmin reactions in Sudan, Indonesia, and India, where general population groups were tested by special W.H.O. teams (Edwards et al. 1956) using the U.S. Public Health Service's H-42. In Equatoria, Sudan,

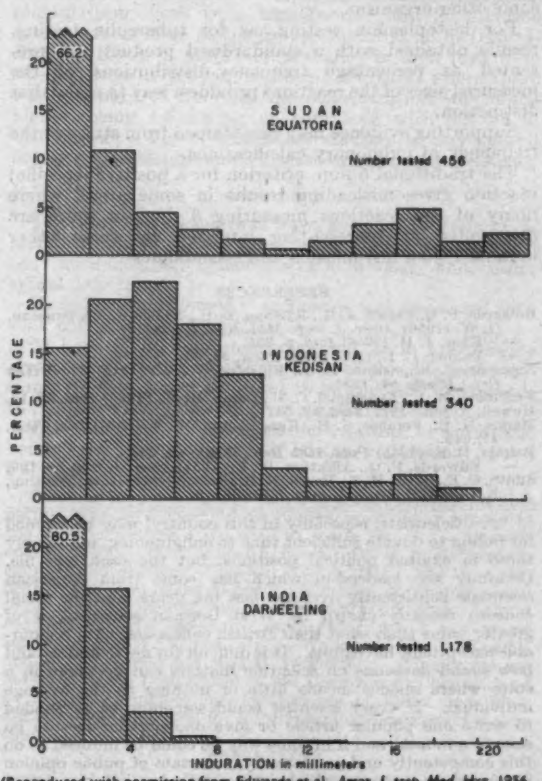


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Fig. 9—Histoplasmin reactions in general population groups in three different parts of the world.

the distribution shows the characteristic bimodal pattern, where the population is clearly divided into two groups, one very likely infected by histoplasma, the other uninfected. The point of separation between the two groups might be made at about 8 mm., whereas in the endemic area of the U.S.A. the point of separation is considerably lower. This difference probably reflects only a difference in measuring the sizes of the reactions, for we have reason to believe that the reader in Sudan measured uniformly larger than the readers in the States. The important point, however, is that the patterns of the distributions in the two regions are very similar: both show two fairly distinct groups of reactions which can, with some confidence, be interpreted as representing specific and negative reactions. In each case a fair estimate can thus be made of the prevalence of histoplasmal infection in the locality.

In Kedisan, Indonesia, the distribution is strikingly similar to that found in our section II (fig. 8), where the small percentage of large reactions may well represent specific sensitivity but the great mass of small reactions should probably be interpreted as non-specific. In Darjeeling the population appears to be essentially negative: one could hardly cut off the tail of the distribution at 5 mm. and regard the larger reactions as positive.

Summary

Histoplasmin testing is a most useful epidemiological tool for defining the geographic distribution and prevalence of infection with histoplasma; but it is important to distinguish between specific reactions caused by infection with the fungus *H. capsulatum* and non-specific reactions resulting from sensitisation by some other organism.

For histoplasmin testing, as for tuberculin testing, results obtained with a standardised product and presented as percentage frequency-distributions of the measured sizes of the reactions provide a way to make that distinction.

Supporting evidence may be obtained from study of the frequency of pulmonary calcifications.

The traditional 5 mm. criterion for a positive (specific) reaction gives misleading results in some areas, where many of the reactions measuring 5 mm. or more are interpreted as representing infection by some other organism than histoplasma and coccidioides.

REFERENCES

Edwards, P. Q., Geser, A. G., Kjelbye, E. H., Meijer, J., Christensen, O. W. (1956) *Amer. J. trop. Med. Hyg.* **5**, 224.
— Kiser, J. H. (1956) *Ibid*, p. 235.
— Palmer, C. E. (1957) *Dis. Chest*, **31**, 35.
Emmons, C. W., Olson, B. J., Eldridge, W. W. (1945) *Publ. Hlth Rep., Wash.* **60**, 1383.
Furcolow, M. L., Federspiel. C. E., Larsh, H. W. (1955) *Ibid*, **78**, 12.
Howell, A. jun. (1947) *Ibid.* **62**, 631.
Manos, N. E., Ferebee, S. H., Kerschbaum, W. F. (1956) *Dis. Chest*, **29**, 649.
Palmer, C. E. (1945) *Publ. Hlth Rep., Wash.* **60**, 513.
— Edwards, P. Q., Allfather, W. E. (1957) *Amer. J. Hyg.* **66**, 196.
Smith, C. E., Saito, M. T., Beard, R. R., Rosenberger, H. G., Whiting, E. G. (1949) *Amer. J. publ. Hlth*, **39**, 722.

"... Scientists, especially in this country, may be blamed for failing to devote sufficient time to enlightening, not merely those in exalted political positions, but the rank and file. Certainly the leadership which has come from American scientists consistently over the last ten years, and the social concern recently shown by West German scientists, is of greater value than what their British colleagues, with honourable exceptions, have done. It is difficult for me to understand how sound decisions on scientific matters can be taken in a state where science means little or nothing to the average individual. If every scientist could somehow be persuaded to write one popular article or give one popular lecture on science a month, and if in some way he could be induced to do this competently and consistently, the state of public opinion in regard to science—which is increasingly anti-scientist at present—would be transformed and the world would be correspondingly safer."—D. G. ARNOTT, *Our Nuclear Adventure*, London, 1957; p. x.

THE INCIDENCE OF SPINAL DEFECTS IN HIGH- AND LOW-FLUORIDE AREAS

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OSTEOCHONDRITIS of the spine, of the type described by Scheuermann (1920, 1936) was reported by Kemp et al. (1942) to be fairly common in children living in Oxfordshire villages where the level of fluoride in the water was 0·3–1·2 p.p.m. The worst cases were seen in the lower-income groups and in children with a history of defective nutrition in their early years. Dental mottling, considered to be fluorotic, was sometimes severe. Subsequently Kemp and Wilson (1947) and Kemp et al. (1948) advanced further evidence that the spinal changes were related to sustained malnutrition, contributory causes being postural disturbance and rapid growth. Though these workers could not correlate the spinal changes with the incidence and severity of dental mottling, they interpreted the geographical association as suggesting that fluoride might play a causal rôle when associated with malnutrition.

No opportunity presented itself until 1954 for a really full study of the possible part played by the intake of fluoride in causing osteochondritis. Studies sponsored by the Ministry of Health in high- and low-fluoride areas were then in progress and were planned to include this investigation.

Material and Method

The samples of children (table I) were selected, after consultation with the health authorities concerned, to ensure that the controls resembled as closely as possible the groups examined in the high-fluoride areas. Refusals were less than 3%. The boys were aged 11–14. The figures given relate to those whose films were adequate for our purpose. Nineteen films only were rejected as unsatisfactory.

Mobile X-ray units were used to film the dorsal and lumbodorsal spines. For each high-fluoride sample, and for its control, the same team operated throughout, using the same technique and equipment. The films were examined "blind" by the three assessors (A. J. E., F. H. K., and P. J. K.).

Findings

One assessor (F. H. K.) expressed his findings in terms of all spinal defects or suspected defects observed. These included Scheuermann's disease, nuclear expansions, as described by Schmorl, Schmorl's nodes, and

TABLE I—COMPOSITION OF SAMPLE

High-fluoride area	Level of fluoride in water (p.p.m.)	No. of boys	Control area	Level of fluoride in water (p.p.m.)	No. of boys
Braintree	1·3–3·5	219	Bury St. Edmunds	0·1	210
Other high-fluoride areas in Essex (W. Mersea, Burnham, Harwich)	1·5–5·8	109	Low-fluoride areas in Essex and Surrey (Saffron Walden, Stone-leigh, New Malden)	0·1 or less	142

TABLE II—INCIDENCE OF SPINAL DEFECTS IN HIGH- AND LOW-FLUORIDE AREAS

Stage in epiphyseal development	Diagnosis	Normal					Non-specific defects					Scheuermann's disease					Nuclear expansion					Schmorl's nodes				
	Group*	I	II	III	IV	Total	I	II	III	IV	Total	I	II	III	IV	Total	I	II	III	IV	Total	I	II	III	V	Total
0 and I	Actual no.	36	18	37	26	117	4	2	5	3	14	..	..	Nil	..	..	6	9	6	7	28	..	Nil	..	..	..
	Expected no.	34·2	22·0	35·0	25·8	117	4·1	2·6	4·2	3·1	14·0	..	..	..	..	..	8·2	5·3	8·4	6·7	28·1	..	..	..	..	..
II	Actual no.	89	24	51	33	197	10	2	2	1	15	1	0	2	4	7	12	11	16	15	54	..	Nil	0	1	..
	Expected no.	81·5	26·7	51·1	37·8	197·1	6·2	2·0	3·9	2·9	15	2·9	1·0	1·8	1·3	7	22·3	7·3	14·0	10·4	54	..	..	..	..	..
III	Actual no.	15	13	52	14	93	8	2	8	3	21	1	2	0	2	5	8	12	9	12	41	0	0	1	0	..
	Expected no.	18·8	15·9	41·2	17·1	93	4·3	3·6	9·3	3·9	21·1	1·0	0·9	2·2	0·9	5·0	8·3	7·0	18·2	7·5	41	..	..	..	..	..
IV and V	Actual no.	21	11	16	16	64	4	0	0	3	7	2	2	1	0	5	0	5	1	4	10	..	Nil	..	..	..
	Expected no.	20·3	13·5	12·8	17·3	63·9	2·2	1·5	1·4	1·9	7·0	1·6	1·1	1·1	1·3	5·1	3·2	2·1	2·0	2·7	10·0	..	..	..	..	..
	Total:																									
	Actual no.	161	65	156	89	471	26	6	15	10	57	4	4	3	6	17	26	37	32	38	133	..	..	..	..	..
	Expected no.	154·8	78·1	140·1	98·0	471·0	16·8	9·7	18·8	11·8	57·1	5·5	3·0	5·1	3·5	17·1	42·0	21·7	42·6	26·8	133·1	..	..	..	..	..
	Unknown	1	0	5	1	7	..	Nil	..	..	..	1	Nil	..	..	1	0	0	1	1	2	..	..	..	..	..

* Group I, Braintree (fluoride 1·3–3·5 p.p.m.). Group II, other high-fluoride areas in Essex (fluoride 1·5–5·8 p.p.m.). Group III, Bury St. Edmunds (fluoride 0·1 p.p.m.). Group IV, other low-fluoride areas in Essex and Surrey (fluoride 0·1 p.p.m. or less).

non-specific deformities of the end-plates—i.e., any irregularity of the end-plates which could not be placed in the other categories. The aim of this assessor was to define the normal and to record and categorise all possible deviations from it. His findings therefore should not be read as indicating the incidence of pathological conditions in the sample. He also gave his opinion about the stage of epiphyseal development reached. The likelihood of occurrence of the conditions which he was recording varies with the degree of maturity of the spine. Therefore, in analysis, the findings both in high-fluoride and control areas were distinguished according to the degree of epiphyseal development.

His findings are given in table II, which compares the actual number found in each category and the number expected to be found if no relationship existed between spinal defects and the level of fluoride in the water. The incidence of the various conditions is seen to be very close to expectation in all the samples, and there is no consistent difference distinguishing the high-fluoride samples from their controls.

The other two assessors (A. J. E. and P. J. K.), working in unison, confined their assessment to the incidence of Scheuermann's disease. From the films they diagnosed 2 definite and 4 probable positive cases in Braintree, and 2 definite and 3 probable in Bury St. Edmunds. In the groups from other high-fluoride areas in Essex they diagnosed 2 definite cases and 2 in the controls.

All the assessors were therefore in agreement that the incidence of spinal defects was substantially the same in the high-fluoride areas as in the low-fluoride ones.

Kemp et al. (1942) considered that malnutrition operating in conjunction with fluorosis might cause spinal defects. The boys from the "other high-F areas in Essex" and their controls had been examined medically in connection with other studies relating to fluoride, and 47 of them had been noted as being less well-nourished than their fellows. There were 22 of these in the high-fluoride group compared with 25 controls. No case of Scheuermann's disease was found in either group, and there was no important difference from expectation as regards the other conditions diagnosed. The cause of poor nutritional condition may not in all cases be primarily malnutrition, but in so far as malnutrition exists in Britain today it is likely to be found in such a group.

Discussion

The findings show that 1·5–5·8 p.p.m. fluoride in drinking-water is not associated with a higher incidence of Scheuermann's disease or of the other spinal defects diagnosed in British schoolboys than prevails in comparable low-fluoride areas. Further they reveal no evidence of a positive relationship between exposure to fluoride, malnutrition, and spinal defects today. No definite conclusions can be drawn about the relationship, if any, between fluoride, malnutrition, and spinal defects in 1942 or earlier, when the groups reported on by Kemp et al. had undergone exposure to fluoride. In 1942 the National Food Policy was barely under way, with its emphasis on the provision of foods of special nutritive value at cheap rates for children. In particular the Food Policy led to a considerable increase in the intake of calcium, which has, more commonly than any other factor, been reported to affect the manifestations of fluorosis. Nevertheless those selected because of possible malnutrition, both from high-fluoride and low-fluoride areas were as large as the groups reported on in Oxfordshire by Kemp et al. (1942), and they in their turn were selected from a yet larger group. Further, where there was exposure to fluoride, the concentration was much higher, being 1·5–5·8 p.p.m. compared with 0·3–0·8 in Oxfordshire. Yet no indication emerges of any special liability to Scheuermann's disease or other spinal defects.

Summary

The lumbodorsal spines of boys, aged 11–14, from high- and low-fluoride areas were radiographed to ascertain the incidence of Scheuermann's disease and other spinal defects.

No indication emerged that fluoride was associated with such conditions of the spine.

22 boys in high-fluoride areas and 25 in low-fluoride areas were selected on the grounds of possible malnutrition. Neither group appeared to be specially susceptible to Scheuermann's disease or other spinal defects.

The findings are discussed in relation to conditions before the introduction of Britain's National Food Policy.

The selection and call-up of comparable samples of this nature imposes a considerable burden upon many people in the areas concerned. We wish to thank Dr. G. G. Stewart, county medical officer of health, Essex; Dr. D. A. McCracken, county medical officer of health, West Suffolk; and Dr. J. W. Starkey, medical officer of health, Kingston on Thames; and their medical, dental, and other staffs for their helpful coöperation. We especially thank the two X-ray teams staffed by Mr. W. Merson, Mr. A. Ward, and Mr. D. Knight, and Mr. K. Arnold and Miss M. Wegmüller. Finally, we are indebted to the Department of the Government Chemist, and to the water engineering departments of Essex and West Suffolk County Council for information on analyses of water-supplies.

REFERENCES

Kemp, F. H., Murray, M. M., Wilson, D. C. (1942) *Lancet*, ii, 93.
— Wilson, D. C. (1947) *Brit. J. Radiol.* **20**, 410.
— — Emrys-Roberts, E. (1948) *Brit. J. soc. Med.* **2**, 66.
Scheuermann, H. W. (1920) *Ugeskr. Laeg.* **82**, 385.
— (1936) *Fortschr. Röntgenstr.* **53**, 1.

A COMPARATIVE RADIOLOGICAL STUDY OF CALCIFIED ATHEROMA IN MALES AND FEMALES OVER 50 YEARS OF AGE

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IT is generally believed that atherosclerosis is more prevalent in males than in females. This belief is based mainly on necropsy findings and the morbidity caused by the complications of atherosclerosis. However, necropsy findings and morbidity figures can only give an incomplete picture of a condition which is commonly present in advancing years.

The lack of reliable methods of detecting atherosclerosis during life makes it difficult to assess the true significance of atherosclerosis as a cause of mortality and of morbidity. I suggest, however, that radiography of the abdominal aorta is a valuable aid in bridging this gap. It is generally agreed that the earliest and most severe manifestations of atherosclerosis are found in the abdominal aorta. The radiographic method is limited to the detection of calcified lesions, but in most cases of advanced atheroma sufficient calcium deposits are present to be seen on radiographs.

Haythorn et al. (1936), in their chemical and histological study of the aorta, found the heaviest calcium deposits in the abdominal portion and noticed that the amount of calcium salts corresponded to the severity of the atheromatous lesions.

In the course of my previous investigations (Elkeles 1949, 1950, 1953, 1956) I was impressed by the frequent occurrence of extensive calcified lesions in the abdominal aorta of elderly females, and thought it of interest to use the radiographic method for comparing the incidence and the severity of calcified atheroma in males and females aged more than 50.

Material and Method

In the present investigation 1252 patients (680 males and 572 females) aged 50–80 were examined. The material was unselected and consisted of inpatients and outpatients of general hospitals.

A classification of the calcified atheromatous lesions was attempted by designating a thin linear plaque about 3–5 cm. long as +, 10–12 cm. long or parallel linear shadows as ++, and more extensive lesions involving almost the whole length of the abdominal aorta as +++.

Results

The results are shown in tables I and II. The outstanding result of this investigation is the observation that the incidence and the severity of calcified atheroma of the abdominal aorta are considerably greater in females than in males after the age of 60:

In the 50–60 age-group the incidence of calcified atheroma was greater in males (23%) than in females (13%); in the 61–70 age-group the incidence of calcified atheroma in females (44%) surpassed that in males (41%); and in the 71–80 age-group the incidence in females (71%) far exceeded that in males (47%).

TABLE I—CALCIFICATION OF ABDOMINAL AORTA IN MALES

Age (yr.)	No. of cases	Degree of calcification of abdominal aorta shown by radiography				Percentage of calcification
		0	+	++	+++	
50–60	245	188	27	22	8	23·3
61–70	301	177	64	40	20	41·2
71–80	134	71	23	27	13	47·0
Total	680					

The accompanying figure shows the severity of calcified lesions of the abdominal aorta in both sexes. In the 50–60 age-group the incidence of severe lesions was greater in males (12%) than in females (6%); in the 61–70 age-group it was considerably less in males (20%) than in females (33%); and

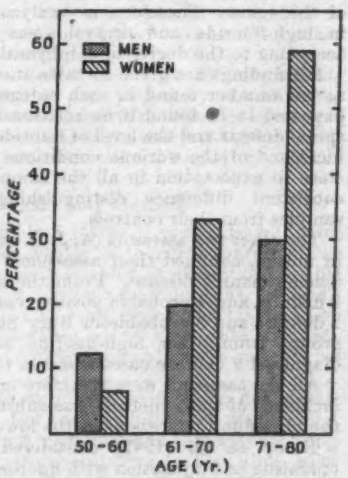
TABLE II—CALCIFICATION OF ABDOMINAL AORTA IN FEMALES

Age (yr.)	No. of cases	Degree of calcification of abdominal aorta shown by radiography				Percentage of calcification
		0	+	++	+++	
50–60	183	159	12	7	5	13·1
61–71	224	126	24	37	37	43·7
71–80	165	47	21	33	64	71·5
Total	572					

in the 71–80 age-group it was twice as common in females (59%) than in males (30%).

Discussion

This remarkable sex difference in the incidence and the severity of calcified atheroma cannot be explained by age or diet but seems to be largely due to endocrine factors. In the reproductive period women show less atherosclerosis than do men: this difference is still noticeable in the 50–60 age-group (see figure). This observation is in agreement with the well-known fact that women aged less than 50 are relatively immune to cardiac infarction. It has been shown that œstrogens have a depressive action on the serum-cholesterol and β-lipoprotein levels (Barr et al. 1952, Oliver and Boyd 1956).



Indication of severe calcification of the abdominal aorta in males and in females.

After the menopause the incidence of coronary-artery disease increases in women but is still less than in males even after the age of 70 (Oliver and Boyd 1956). Thus the steep rise in the incidence and severity of atherosclerosis in women aged more than 60 is not associated with a corresponding sharp increase of coronary infarction. Moreover extensive calcified atheroma of the aorta is predominantly seen in old people, who would not have reached this ripe old age if they had had serious coronary-artery disease. These observations cast doubt on the widely held view of a close relationship between severe atherosclerosis and coronary-artery disease. Similar views have been expressed recently by other workers:

Crawford (1955) points out that, in younger people dying from coronary disease, occlusion has taken place at one of very few plaques present, whereas in elderly people there are often very numerous severe lesions without thrombosis.

Morris and Dale (1955) state that only a minority of those with severe atherosclerosis develop clinical heart-disease.

The alleged close connection between coronary atheroma and coronary infarction has been questioned by *The Lancet* (1955), which refers to Morris's (1951) analysis of London Hospital necropsy records which suggest that, in contrast to the great increase of myocardial infarction, the proportion of

people with advanced atheroma has actually diminished in the past forty years.

Why individuals with advanced atherosclerosis may escape myocardial infarction or have it postponed for a long time is suggested by White et al. (1950), who examined the coronary arteries of 600 men (100 from each of the decades from 30 to 80 years). They point out that coronary-artery disease in the younger age-groups is often fatal within a few minutes after the onset of the attack. They assume that the absence of an adequate collateral circulation is responsible for the sudden death. Myocardial catastrophe of this nature is less common after the age of 50, which fact these workers explain by the development of a collateral coronary circulation gradually getting more effective as the sclerosis increases. Further, these workers did not substantiate the widely held view of a steady increase in the severity of coronary sclerosis with advancing years; they found the maximal severe average grade of sclerosis in men aged 50–59. Beyond this age-group the average grade of sclerosis did not increase.

These findings are in agreement with my finding that the incidence and the severity of calcified atheroma in men show only a moderate increase in the 60–80 age-group in contrast to females (tables I and II and figure).

The striking predominance of calcified atheroma in women requires some comment. The increased severity of calcified atheroma in females aged more than 60 and its excess prevalence in females aged more than 70 do not appear to be influenced by certain diseases but seem to be due to the progression of chemical and physical changes produced by the menopause. The most extensive calcified lesions of the aorta, however, are often seen in elderly women with osteoporosis of the spine. According to Albright (1947) and Albright and Reifenstein (1948) menopausal osteoporosis and senile osteoporosis are due to an imbalance of hormones caused by the cessation of production of œstrogen. In males the production of testosterone decreases at a later age, about 70–80 (Albright 1947). This may explain why osteoporosis of the spine is more common in females than in males, the ratio of women to men being 6 to 1 at all ages (Cooke 1955). Postmenopausal osteoporosis and senile osteoporosis are merely advanced stages of a physiological osteoporosis of the spine which has its onset at the menopause and increases in degree with age. According to Cooke (1955) a large proportion of persons aged more than 70 have osteoporosis.

About 30% of the calcium in the spine must be lost before osteoporosis can be detected on radiographs. Since the affinity of the tissues of the aorta to calcium in advancing years is greater than that of the circulating blood (Haythorn et al. 1936), it is feasible that a good deal of calcium and phosphorus, no longer utilised by the bones, is deposited in the aorta. There is evidence that the aortic calcification has much the same composition as bone (Barillé 1910, Schoenheimer 1928). I therefore suggest that a relationship exists between the predominance of calcified atheroma in women aged more than 60 and postmenopausal spinal osteoporosis.

A related question is that of sex susceptibility to cancer at different ages. In previous investigations I have shown that, with some exceptions—e.g., bronchial carcinoma—cancer patients have significantly less calcified atheroma than have controls in the same-age-groups. This difference is striking in carcinoma of the stomach and has been confirmed by Doll (1956) and Avery Jones (1957) and is in agreement with Dungal's (1953) findings of a very high incidence of gastric cancer and a low incidence of calcified aorta in Iceland. Let us consider whether a connection exists between the cancer-atherosclerosis theory (Elkeles 1949, 1950, 1953, 1956), the statistical studies on sex susceptibility to cancer, and the results of the present investigation.

Cowdry (1955) states: "The cancer rates are higher at all ages for males than for females, except during the decades between 25 and 54, when conditions are reversed, and the cancer mortality rates for females are distinctly greater than for males."

McKeown (1956) finds that males are more frequently affected by carcinoma than are females in the later decades of life.

Bauer (1949) points out that cancer in women in the age-group 45–60 is twice as common as cancer in men in a similar age-group; after the age of 60 the sex-incidence ratio is reversed.

Correlating these statistical findings with the results of the present investigation, we find that the age-groups with a low incidence of atherosclerosis in women coincide with those with a high incidence of cancer. After the age of 60, when females show a significant predominance of calcified atheroma, the cancer-rate is considerably lower in women than in men.

Thus the results of the present investigation, in conjunction with the aforesaid reports on sex susceptibility to cancer, are further evidence for my theory that people with severe calcified atheroma are relatively immune to cancer.

Summary

Radiography of the abdominal aorta is a valuable method of detecting advanced atherosclerosis during life.

This method was used to compare the incidence and the severity of calcified atheroma in 680 males and 572 females aged more than 50.

The incidence and the severity of calcified atheroma are much less in females than in males below the age of 60, but in the later decades of life the sex ratio is reversed, and women show a much higher percentage of severe calcified atheroma than do men.

The results of this investigation do not support the widely held view of a close relationship between severe atherosclerosis and coronary-artery disease in so far as this can be estimated from calcification in the abdominal aorta.

The theory is advanced that spinal osteoporosis occurring after the decrease or cessation of sex-hormone production is connected with the deposition of calcium in the aorta, and that spinal osteoporosis, which is far more common in women than in men, explains the high percentage of severe calcified atheroma in females after the menopause.

An attempt was made to correlate the cancer-atherosclerosis theory with the results of the above investigation and with reports on the sex susceptibility to cancer at different ages. It has been found that, in women up to the age of 60, the incidence of atherosclerosis is much less than in men; whereas the cancer-rate is much larger than in men. In the later age-groups, when females show a significantly higher incidence of calcified atheroma than do men, cancer is much more common in males than in females.

The result of this investigation in conjunction with the observations on sex susceptibility to cancer are further evidence that people with severe calcified atheroma are relatively immune to cancer.

REFERENCES

Albright, F. (1947) *Ann. intern. Med.* **27**, 861.
— Reifenstein, E. C. jun. (1948) The Parathyroid Glands' and Metabolic Bone Disease. Baltimore.
Barillé, A. (1910) *J. Pharm. Chim., Paris, ser.* **7**, **1**, 342.
Barr, D. P., Russ, E. M., Eder H. A., (1952) *Trans. Ass. Amer Physns.* **65**, 102.
Bauer, K. H. (1949) Das Krebsproblem. Berlin.
Crawford, T. (1955) *Proc. R. Soc. Med.* **48**, 661.
Cooke, A. M. (1955) *Lancet*, i, 929.
Cowdry, E. V. (1955) Cancer Cells. Philadelphia.
Doll, R. (1956) *Gastroenterologia*, **86**, 320.
Dungal, N. (1953) *Schweiz. Z. Path.* **16**, 634.
Elkeles, A. (1949) *Brit. J. Radiol.* **22**, 280.
— (1950) *Int. Congr. Radiol.* p. 78.
— (1953) *Amer. J. Roentgenol.* **70**, 797.
— (1956) *Brit. J. Cancer* **10**, 247.
Haythorn, S. R., Taylor, F. A., Crago, H. W., Burrier, A. Z. (1936) *Amer. J. Path.* **12**, 283.
Jones, F. A. (1957) *Brit. med. J.* i, 786.
Lancet (1955) ii, 1123.
McKeown, F. (1956) *Brit. J. Cancer*, **10**, 251.
Morris, J. N. (1951) *Lancet*, i, 69.
— Dale, R. A. (1955) *Proc. R. Soc. Med.* **48**, 667.
Oliver, M. F., Boyd, G. S. (1956) *Lancet*, ii, 1273.
Schoenheimer, R. (1928) *Hoppe-Seyl. Z.* **177**, 143.
White, N. K., Edwards, J. E., Dry, T. J. (1950) *Circulation*, **1**, 645

SYMPTOMATOLOGY AND PROGNOSIS OF ABDOMINAL AORTIC ANEURYSM

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SUCCESSFUL excision of abdominal aortic aneurysms, and their replacement by an aortic homograft or suitable plastic prosthesis has created new interest in this subject, and the diagnosis of such aneurysms is no longer of academic interest only. Thus the symptomatology of these lesions must be clearly defined, as well as their natural life-history; and it must be established that the prognosis without treatment is bad enough to warrant a major operation. Recent articles on this subject have been largely concerned with treatment, and these facets of the problem remain matters of considerable debate—at least on this side of the Atlantic. I have here particularly emphasised both symptomatology, including the syndrome of aneurysmal rupture, and prognosis.

Material

The present series of 51 cases of abdominal aortic aneurysm was collected from the inpatient and necropsy files of the Bristol Royal Hospitals from 1939 to July, 1956. 20 of these cases were found in the last five and a half years. In 14 patients dying from unrelated disease, the diagnosis was first made at necropsy. In a further 19, a clinical diagnosis was later confirmed by necropsy, and in 9, by laparotomy. In 7 of the remaining 9 cases, the clinical finding of a smooth firm pulsatile abdominal tumour was supported by the presence of either aneurysmal dilatation of the abdominal aorta on aortography, or calcification in the wall of the aneurysm in the plain abdominal radiograph.

TABLE I—AGE-DISTRIBUTION AT TIME OF DIAGNOSIS

Age (yr.)	All cases		Incidental necropsy findings		Men		Women	
	No.	%	No.	%	No.	%	No.	%
41–50 ..	2	4	1	7	1	3	1	6
51–60 ..	8	16	1	7	8	23	0	0
61–70 ..	26	51	8	57	17	50	9	53
71–80 ..	12	23	3	22	7	21	5	29
81 and over	3	6	1	7	1	3	2	12
Total ..	51	100	14	100	34	100	17	100
Average age	66		66		65		69	

The aneurysm may have had a syphilitic basis in 1 patient with locomotor ataxia, though at necropsy the aorta and iliac arteries were severely atheromatous. This aneurysm was saccular and arose from the right common iliac artery, just distal to its junction with the aorta. It has been included because it had been diagnosed clinically as an aortic aneurysm. All other cases, as far as was known, arose from the aorta, and the evidence, including histological examination of the aortic wall in all necropsy cases, pointed to arteriosclerosis as the cause. Wassermann and Kahn tests were done in 20 cases and were all negative. Trauma and infection did not appear to play any part. Dissecting aneurysms were excluded.

Clinical Findings

Sex and Age

There were 34 men and 17 women. The average age at the time of initial diagnosis, whether clinical or necropsy, was 66 years (table I) with extremes of 45 and 92. The youngest patient diagnosed clinically was 50. In the 14 cases diagnosed as incidental necropsy findings, the age-distribution was similar to that of the group as a whole. 50% of all cases were diagnosed in the seventh decade and 25% in the eighth. These figures are comparable to those of other reported series of arteriosclerotic abdominal aortic aneurysms (Estes 1950, Zech and Merendino 1954, Wright et al. 1956). It is worthy of note, however, that 10 patients (19%) were aged 60 or less. Table I shows, moreover, that 9 of these were men.

Symptoms and Signs

3 patients were admitted and died in coma from causes other than the aneurysm, which was not clinically recognised, and accordingly no history was obtained.

TABLE II—SYMPTOMS IN 48 CASES OF ABDOMINAL AORTIC ANEURYSM

Symptom	Number affected			
	All symptoms		Exclusive of rupture symptoms	
Pain	37		22	
Abdomen		34		22
Back		21		10
Thigh		6		2
Gastro-intestinal	27		13	
Shock	16		0	
Abdominal mass	7			
Abdominal throbbing ..	10			
Weight-loss	13			
None	8		24	

When all symptoms present up to and including the period of hospital admission were included, pain was noted in 37 cases (77%) and was abdominal in 34 (table II). In 11 the pain was confined to the abdomen, while in 21 it radiated either to or from the back and in 6 was felt also in the thigh. Other less common sites of radiation were loin, shoulder, and arms, or groin and testicle. 27 patients (56%) had gastro-intestinal symptoms (anorexia, nausea, vomiting, and diarrhœa) and 16 were shocked. 13 patients (most of whom had pain) had lost weight, but the records were complete in this regard in only 35 cases. Melæna was mentioned by 3 patients and recurred one or more times in 2 of them. All 3 of these ultimately died from retroperitoneal rupture, proven at necropsy. Only 8 (17%) of the 48 patients had no symptoms whatever. The high incidence of pain, gastro-intestinal symptoms, and shock, was attributable to the 18 patients admitted to hospital as acute emergencies with aneurysmal rupture, for when symptoms due to proven rupture were excluded (table II), 50% were completely asymptomatic and only 46% complained of abdominal pain.

Of the physical signs, a pulsatile abdominal tumour was noted in only 28 cases, and a non-pulsatile mass in 4. Although obesity may have been a factor in failure to palpate the aneurysm, its low incidence (14 cases) shows that this explanation is incomplete. The mass was located in the left upper quadrant of the abdomen in 19 cases, the right upper quadrant in 4, and the midline in 5. Abdominal guarding was found in 11 cases, always with rupture; 29 patients had abdominal tenderness. Half the women and half the men (a total of 29 patients) were hypertensive, with a diastolic pressure greater than 90 mm. Hg. and a systolic pressure higher than that expected for their age.

Obvious difficulty arises when attempting to relate many of these symptoms and signs to the aneurysm. To clarify this relationship, the findings in the 18 proven cases of aneurysmal rupture observed in hospital will be analysed in detail and later compared with those present before rupture.

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Rupture of the Aneurysm

Rupture of the aneurysm (table III) was signalled by the onset of pain in all cases except 1 and 18, in which the initial symptom was collapse. In the remaining 16 patients, pain was the predominant symptom and had the following features:

(*a*) It was severe, being variously described as murderous, constricting, burning, stitch-like, or sharp.

(*b*) It was sudden in onset, and, when more gradual, increased to its maximum within a few hours.

(*c*) In half the cases it was constant and in half colicky, the patient rolling about rather than lying still.

(*d*) It began in either the abdomen (10 cases), usually across the lower portion or on the left side, or in the lower back (5 cases).

(*e*) The pain radiated in the great majority, usually from abdomen to back, or vice versa, and occasionally from these sites to groin and testicle, simulating renal colic (Pearlman 1940, Uhle 1941, King and Robinson 1956), or to the thigh. In 2 patients it radiated upwards into the chest, neck, and shoulder or arm.

(*f*) The pain was intermittent, tending to recur in bouts of increasing severity.

In all patients in whom the length of history from onset to death (or recovery) exceeded forty-eight hours, there were one or more periods during which there was almost complete freedom from pain. These latent periods were unrelated to the use of opiates.

Shock, though a constant feature before death, was not necessarily an initial finding. The degree of shock present during the first twelve hours of admission has been graded (table III) as severe (+++) requiring urgent replacement therapy, moderate (++), and mild (+). 10 of the 18 patients were severely shocked during this twelve-hour period. 5 (28% of the total) died within this interval despite blood replacement; in cases 1 and 12 the patients lost consciousness and remained unconscious until death, but the remaining 5 patients responded to a degree sufficient to allow surgical exploration, which was undertaken in 3. Mild or moderate shock was present in 6 patients, and in cases 6 and 13 there was no shock during these twelve hours. In case 4 the patient recovered, and the remainder did not die until an average of seven and a half days after admission. Thus death was delayed for twenty-four hours or longer in 13 patients (72%), the clinical picture being characterised by recurring attacks of pain, with or without shock, until the final fatal episode of sudden, profound circulatory collapse.

Gastro-intestinal and urinary symptoms were also present in a number of these cases (table III). Anorexia was recorded in 4 and nausea in 6. Most patients vomited, but only (as by reflex) at the onset of pain. In cases 1, 6, 7, and 13, however, vomiting was persistent and severe. 4 had diarrhœa at the onset; in 2 it became persistent and severe. 2 patients had melæna over periods of twenty-four hours and fourteen days before death. Urinary symptoms consisted of difficulty in voiding, frequency, and urgency. There was a history suggestive of prostatic obstruction in case 9 but no previous urinary symptoms in the remainder. Anuria was not a feature.

The abdominal signs accompanying rupture included a definite pulsatile abdominal tumour in only 11 of the 18 cases (table III), and in a further 3 a non-pulsatile mass was perhaps palpable. In 4 the tumour enlarged gradually during the course of the illness. Tenderness, greatest over the mass when one could be felt, was usual but seldom very severe. Abdominal guarding was not striking, being recorded as mild or moderate in only half the conscious patients, and distension was not gross. Another finding worthy of comment, was the appearance in 3 cases, within three days of the onset of symptoms, of ecchymoses in either flank or scrotum and penis. This physical sign was first reported by Pearlman (1940). A thrill or bruit over the mass was not sought in most cases.

A correct clinical diagnosis of rupture was made in 7 of the 18 patients, more often in cases presenting with severe shock: 50% of this group were correctly diagnosed, compared with 25% of the remainder. Moreover, it was made only once in the absence of a pulsating tumour. Rupture was correctly diagnosed in 3 of the 4 patients in whom the aneurysm had been diagnosed before rupture. A common initial diagnosis was acute pancreatitis; serum-amylase estimations were ordered in 6 patients, in all of whom they were normal. A moderate leucocytosis was found in 4 of 6 patients. The temperature was usually subnormal or only slightly elevated, but it rose to 102°F in 1 patient on the fifth day of illness.

Symptoms before Rupture

As noted in table II, 22 patients had pain before rupture. In 7 it consisted of epigastric ulcer-type dyspepsia, and in 3 this was the only complaint. In 2 a peptic ulcer was found at necropsy. As the dyspepsia tended to be mild and of many years' duration,

TABLE III—CLINICAL FINDINGS IN 18 CASES OF RUPTURED ANEURYSM OBSERVED IN HOSPITAL WITH NECROPSY OR LAPAROTOMY PROOF OF DIAGNOSIS

Case	Date	Age and sex	Duration*		Symptoms											Abdominal signs				Leucocyte-count (cells per c.mm.)	Correct clinical diagnosis	Laparotomy	Outcome‡
					Nature of pain			Site of pain				Gastro-intestinal		Urinary	Shock†	Mass	Tenderness	Guarding	Distension				
			Before	After	Sudden	Severe	Colic	Abdomen	Back	Groin	Thigh	Vomiting	Diarrhœa										
1	1942	74M	24 hr.	12 hr.	–	–	–	–	–	–	–	+	+	–	+++	+	–	–	–	..	–	–	D
2	1946	70F	4 ,,	30 ,,	+	+	?	+	+	–	–	–	–	–	+++	+	–	–	–	..	–	–	D
3	1947	64M	6 ,,	48 ,,	+	+	–	–	–	+	+	–	–	–	++	–	+	–	+	13,000	–	–	D
4	1950	63F	14 days	..	–	+	+	+	+	–	–	+	+	+	++	+	+	–	–	7450	+	+	R
5	1951	64M	3 hr.	9 days	+	+	+	+	–	–	–	+	–	+	++	?	+	+	+	13,300	–	+	D
6	1951	60M	48 ,,	24 hr.	+	+	+	+	+	–	+	+	–	–	–	?	+	+	–	13,000	–	–	D
7	1952	64M	72 ,,	5 days	–	+	–	+	+	–	–	+	–	–	+	–	+	+	+	20,300	–	+	D
8	1952	67M	15 ,,	12 hr.	–	+	+	+	+	+	–	+	–	+	+++	–	+	+	–	..	–	–	D
9	1952	71M	3 ,,	6 ,,	+	+	+	+	+	–	–	–	–	+	+++	+	+	+	–	..	+	–	D
10	1954	68M	6 ,,	11 days	–	+	–	+	+	–	–	+	+	+	+	+	+	–	+	8700	+	–	D
11	1955	65M	12 ,,	30 hr.	–	+	+	+	+	–	–	+	–	–	+++	+	+	+	–	..	–	–	D
12	1955	77F	8 ,,	12 ,,	+	+	+	+	–	–	–	+	+	–	+++	+	–	–	–	..	+	–	D
13	1955	73F	8 ,,	32 ,,	+	+	+	+	+	–	+	+	–	–	–	+	+	+	–	..	–	–	D
14	1955	66F	48 ,,	17 days	–	+	–	+	–	–	–	–	–	–	+	+	–	–	–	..	–	–	D
15	1955	73M	2 ,,	..	+	+	+	+	+	–	–	+	–	–	+++	+	+	+	–	..	+	+(graft)	R
16	1956	68M	2 ,,	10 hr.	+	+	–	–	+	–	+	–	–	–	+++	?	+	–	+	..	+	+	D
17	1956	63M	52 ,,	6 ,,	+	+	+	+	+	+	–	+	–	–	+++	–	+	–	+	..	–	–	D
18	1956	54M	1 ,,	24 ,,	–	–	–	+	+	–	–	–	–	–	+++	+	+	–	+	..	+	+(graft)	D

* Duration of symptoms before and after admission.
† Shock during first 12 hours following admission—see text.
‡ D = died; R = recovered.

TABLE IV—PRESENTING SYMPTOMS AND TIME OF ONSET BEFORE DIAGNOSIS*

Symptom	No. of cases	Time of onset before diagnosis					
		<1 wk.	1–4 wk.	1–12 mos.	1–2 yr.	2–3 yr.	3 yr. and over
Abdominal pain ..	19	10	3	3	..	..	3
Back pain	5	3	1	1	..	..	..
Abdominal pulsation ..	7	..	2	2	..	2	1
Collapse	2	2	..	..	..	..	..
Total	33	15	6	6	..	2	4

* Melæna has not been considered a presenting symptom.

it was probably unrelated to the aneurysm. In 4 patients, the pain was dull and persistent—a dragging sensation—felt in the umbilical region, with or without low backache. 15 of these 22 patients, however, complained of attacks of sharp colicky abdominal pain of sudden onset and usually of short duration, which were accompanied by gastro-intestinal symptoms in 11. The pain tended to be intermittent and to radiate from the mid-abdomen to the back or vice versa, or occasionally to the groin or thigh. Several patients had recurrent attacks, separated by an interval of weeks, months, or even years in which they were completely free from symptoms. The similarity of this pain to that resulting from proven rupture was striking, differing only in being less severe and not accompanied by shock. 4 of these patients were, however, admitted to hospital as emergencies because of severe pain, which had been present intermittently for from six to twenty-one days, and in the 3 in whom a tender pulsatile abdominal mass was felt a diagnosis of leaking aneurysm was made. Although none were shocked, the hæmoglobin level was significantly reduced. All recovered. It should be noted that the only patient with proven rupture to survive without corrective surgery (case 4, table III), also had intermittent pain for fourteen days before admission—a much longer interval than in the fatal ruptures. All these patients, including case 4, died from aneurysmal rupture, at intervals of three weeks, and two, four, five, and five years later.

Presenting Symptoms

These, together with the time-interval between their first appearance and the diagnosis of aneurysm, are given in table IV. The 14 aneurysms diagnosed only at necropsy, in patients dying from unrelated disease, have been excluded from this analysis. Of the remaining 37 patients, the presenting symptom was not known in 1, while 3 had no symptoms, the aneurysm being discovered during examination for other disease. Pain was the initial symptom in 24 of the remaining 33 cases, in 21 of which its onset preceded the diagnosis of aneurysm by less than a year and in 17 by less than a month. Among the total of 21 patients in whom the interval between onset and diagnosis was less than a month were 14 (38% of the 37 diagnosed cases), whose first symptoms were those due to proven rupture.

Treatment and Prognosis

Some form of corrective surgery was attempted in 10 patients. Resection of the aneurysm and graft replacement was undertaken in 3. 1 of these operations was elective, the patient dying postoperatively, and 2 were emergencies after rupture: 1 patient survived. 'Cellophane' wrapping with partial proximal ligation was tried once in 1949, but the patient died from rupture a month later, while still in hospital. Since 1953, the aneurysm has been wired in 5 patients, 1 dying postoperatively, and a 2nd from rupture two and a half years later; the remaining 3 were alive one, two, and three years later.

TABLE V—CAUSES OF DEATH IN 44 FATAL CASES

Cause of death	No. of cases	No. at necropsy
Rupture	23	15
Cardiac	5	3
Cerebrovascular accident	5	4
Bleeding peptic ulcer	2	2
Surgical	2	2
Other	7	7
Total	44	33

Follow-up was complete in 50 of the 51 cases. 35 patients died in hospital, and information concerning the remainder was obtained from the attending doctors. I examined the 6 survivors. The causes of death are given in table V, together with the number of necropsies in each group. Necropsy confirmation was lacking in 8 of the 23 rupture cases. Although 6 of these patients died at home, their doctors were aware of both the presence of the aneurysm and the possibility of rupture. The chief causes of death besides rupture were heart-failure and cerebral hæmorrhage, 20% of the group dying from these causes. Two cases in this category had ruptured aneurysms of the circle of Willis.

The life expectancy after the time the aneurysm was first diagnosed has been considered in table VI. Accordingly, for the purpose of this analysis, the 14 aneurysms discovered only incidentally at necropsy were excluded, while all cases presenting with rupture were considered as having been clinically diagnosed on admission. 17 (47%) of the remaining 36 patients died in less than a year from the time of diagnosis—16 from rupture. 22 untreated cases were diagnosed before July, 1953, and of these 1 is still alive three years later, while 16 (73%) have died from rupture. 2 of these 16 patients survived for five years.

TABLE VI—LIFE EXPECTANCY IN 36 CLINICALLY DIAGNOSED CASES

Year of diagnosis	No. of cases	Length of survival (yr.)						
		<1	>1	>2	>3	>4	>5	>6
1942	1	1	..	..	..	..	..	..
1946	2	1	..	1	..	..	..	..
1947	2	1	1	..	..	..	..	..
1949	2	1	..	..	..	..	1	..
1950	4	..	1	..	1	1	1	..
1951	4	3	..	1	..	..	..	..
1952	4	2	..	..	2	..	..	..
1953	3	..	..	2	1*	..	..	..
1954	6	2	1	3*	..	..	..	..
1955	5	3†	2*	..	..	..	..	..
1956	3	3†	..	..	..	..	..	..
Total ..	36	17	5	7	4	1	2	0
Death from rupture ..	23	16	0	3	2	0	2	0

* Alive July, 1956. † Dead July, 1956.

Necropsy Findings

The necropsy incidence of abdominal aortic aneurysm for the whole period was 0·66% (33 cases in 4970 necropsies). But in the first nine years (1939–47) there were 6 cases in 2116 necropsies (0·28%) and for the second period of nearly nine years (1948 to July, 1956), 27 cases in 2855 (0·95%). Thus these lesions are now being found at necropsy about three times as often as was the case ten years ago. This fact has been emphasised by Blakemore and Voorhees et al. (1954) and Brindley and Stembridge (1956).

Half the aneurysms were saccular and half fusiform. The greatest diameter of the sac was recorded in 22 cases and averaged 6·5 cm. (3–15 cm.). The smallest aneurysm clinically palpable measured 4 cm. Conversely, in 8 of the 14 patients in whom the aneurysm was not noted clinically, its diameter exceeded 4 cm. In most cases dying from rupture the aneurysm was larger than average, but in 3 it measured 4, 4·2, and 5·5 cm.

Rupture was equally common in the saccular and fusiform types, and occurred through a longitudinal tear in either the posterior or lateral wall of the sac. A large retroperitoneal hæmatoma was a constant finding. Free intraperitoneal blood was significant in amount in only 4 patients, and in only 1 was it the sole site of bleeding. The findings did not support the contention, so often repeated, that sudden death was due to intraperitoneal bleeding, for in the 2 patients dying most rapidly the hæmorrhage was confined to the retroperitoneum. Contrary to the findings of Zech and Merendino (1954), paralytic ileus did not accompany retroperitoneal rupture.

Minor pressure atrophy of the anterior bodies of the lower lumbar vertebræ was noted in only 3 instances. In 1 case, however, the sac had compressed and distorted the right ureter sufficiently to cause moderate hydronephrosis, and in another patient a loop of sigmoid colon had become adherent to the anterior wall of the sac with resultant large-gut obstruction.

The major branches of the abdominal aorta, exclusive of the inferior mesenteric, were occluded in only 2 cases. In 1 asymptomatic patient, in whom the aneurysm arose opposite the renal arteries, both these vessels were affected, the left being occluded completely and the right to a third of its original diameter. In the 2nd patient, the left external iliac artery was occluded throughout by thrombus which extended into the common femoral artery. In the remaining patients the iliac and upper femoral vessels were not only patent, but, in the majority, dilated and tortuous.

The aneurysm was situated above the renal arteries in 32 of 34 cases (including the resected specimen). 12 of the fusiform aneurysms began in the first 3 or 4 cm. of the aorta below the renal arteries and extended to the aortic bifurcation. 12 additional aneurysms were found in 7 patients (14% of the total and 21% of the necropsied cases). 5 arose in the common or internal iliac vessels, 3 in the circle of Willis, and the remainder in the abdominal aorta below the renal vessels. The latter aneurysms were small and saccular in type.

Discussion

It has been well established that the great majority of abdominal aneurysms arise from the aorta below the level of the renal arteries, that they are arteriosclerotic in origin, and that they are increasing in incidence. Moreover, the incidence of syphilitic aortic aneurysm has rapidly declined (Maniglia and Gregory 1952), and, in accordance with these facts, the average age of patients presenting with abdominal aneurysm has increased to over 60 years. The present cases emphasise that arteriosclerotic aneurysm can, however, arise at as early as 45 years of age, particularly in men. The changing ætiology of abdominal aortic aneurysm can be shown, in the Bristol area, by comparison of the present arteriosclerotic cases with those collected by Nixon (1911) from the Bristol Hospitals over the period from 1854 to 1911. Nixon's series included 20 cases listed as abdominal aortic aneurysm of which, however, 9 arose from various branches (mostly cœliac axis) or were dissecting in type. Of the remaining 11, at least 8 arose from the aorta above the renal vessels. The average age of these patients was 36 years (range 20 to 50). These features suggest that most of these aneurysms were syphilitic.

The symptomatology has in consequence also changed. Syphilitic aneurysms, arising usually above the renal vessels, enlarge both forwards against the stomach and backwards against the spine, with erosion of vertebral bodies and production of root pain. The cases reported by Kampmeier (1936), Hubeny and Pollack (1940), and Scott (1944), undoubtedly consisted largely of syphilitic aneurysms with the above characteristics. The arteriosclerotic aneurysm, however, because of its position, does not usually compress the stomach, nor does it erode vertebræ (Epstein 1945, Blakemore 1947, Estes 1950) and accordingly neither dyspepsia nor root pain would be expected features of the condition. In fact, while pain was present in over 90% of Kampmeier's series of syphilitic abdominal aneurysms, before rupture only 46% of the present series complained of pain and 50% were completely asymptomatic. Although it cannot be denied that aortic aneurysm arising below the renal arteries can be responsible for certain bizarre symptoms such as those resulting from compression of the third part of the duodenum (Washburn and Wilbur 1936) or from adherence of a loop of gut to the sac, this analysis suggests that, before frank rupture, there are only two types of pain resulting directly from the aneurysm —namely, a dull ache in the umbilical region or lower back, and, more important, a sharp severe pain which may radiate in several directions and which, while usually of short duration, may occasionally become continuous. This sharper pain was noted in 15 (64%) of the 24 symptomatic patients in this series before rupture. The striking similarity between this pain and that due to frank rupture suggests that both are due to extra-peritoneal extravasation of blood in small or large amounts.

The difficulty of diagnosing abdominal aortic aneurysm has been repeatedly emphasised (Epstein 1945). Before rupture, diagnosis rests largely on the demonstration of a pulsatile abdominal tumour. It seems probable that, in the absence of obesity, the sac must measure at least 4 cm. across before it is readily palpable, though there is little doubt that with greater care the number of aneurysms palpated would increase. This series suggests that the history may be a help in diagnosis, for an appreciable number of patients will have had attacks of characteristic colicky abdominal pain. For confirmation, plain abdominal radiography and aortography may be used.

Rupture may also be hard to diagnose. Failure to palpate the aneurysm is again one of the chief causes, for the correct diagnosis was made once only in this series when no aneurysm was felt. Goldowsky (1952) found an abdominal mass in only 7 of 15 cases with rupture (2 of which involved, however, dissecting aneurysms), and Zech and Merendino (1954) noted a mass in only 17 of 27 cases; in only 5 was it pulsatile. The associated abdominal distension, tenderness, and guarding, if considerable, may mask the aneurysm, and shock, by decreasing the tension within the sac, may also contribute. But as the mass tends to enlarge, because of increase in size of the retroperitoneal hæmatoma, it should be repeatedly sought for. Although recorded only 4 times in the present series, an enlarging mass is in all probability commoner than these figures suggest. There are two further features of rupture which may completely mislead the clinician. Firstly, severe shock is an initial symptom in no more than half the cases, and, while rupture may be rapidly fatal, there is ample evidence from this and other reports (Blakemore 1947, Goldowsky 1952) that the illness is less dramatic in the majority and that death is usually delayed for days or weeks. Secondly, the pain of rupture is almost invariably intermittent. Previous authors, with the exception of brief mention by King and Robinson (1956), have not given sufficient emphasis to this point.

Of other abdominal emergencies, acute pancreatitis and mesenteric vascular occlusion most resemble the syndrome of rupture. Both present with severe pain and shock of varying degree and the signs of peritoneal irritation are usually minor. Goldowsky (1952) noted an elevated serum-amylase in a case of rupture, and delayed bruising in the flank is common to both rupture and acute pancreatitis. Mesenteric vascular occlusion may be mimicked when melæna appears after rupture of an aneurysm.

Laboratory aids to diagnosis are few. A moderate leucocytosis and a reduced hæmoglobin may support a doubtful diagnosis. Javid et al. (1955) emphasise the usefulness of plain abdominal radiography, which may reveal not only calcification of the sac, but also a more peripheral shadow due to the retroperitoneal hæmatoma. This double-contour shadow was not demonstrated in any of the present cases.

Some generalisations seem justified regarding the outcome of rupture. Patients having intermittent pain for days or weeks before admission, and those in whom shock is initially absent or slight, may survive the attack. But once significant shock appears, death will rarely be delayed longer than a week. If it is accepted that attacks of sharp pain are the result of leakage, it seems probable that a significant number of patients (about a third of the diagnosed cases in this series) survive their initial leak. One cannot forecast, however, the interval of freedom from recurrence. There is no convincing evidence, either from this or from other reports, that the prognosis is worse in symptomatic cases. Thus Estes (1950), in a much larger series from the Mayo Clinic, could find no systematic difference in prognosis between symptomatic and asymptomatic cases.

Estes considered the prognosis of arteriosclerotic abdominal aortic aneurysm from the time of clinical diagnosis. He found that 67% of cases survived for more than a year, 49% more than three years, and 19% more than five years. In the present series, however, 47% of the patients were dead in less than a year from diagnosis. This high immediate mortality reflects the inclusion of a large number of emergency admissions for rupture, and agrees with other reported hospital series (Zech and Merendino 1954, Wright et al. 1956). The finding that 46% of the 50 followed cases in this series died from rupture, while only 20% died from other cardiovascular disease, emphasises that the aneurysm itself is the most serious risk to life. The likelihood of ultimate rupture in cases diagnosed clinically was 73% for cases followed three years or more in this series, compared with 63% in Estes's series.

These figures certainly justify a surgical approach to this lesion. Since resection of the aneurysm was introduced by Dubos et al. (1952), this operation has been fairly widely accepted as the best one. The age of these patients, however, and the presence of generalised cardiovascular disease, makes selection no easy matter (Bahnson 1954, Wright et al. 1956). Although we have no data about the proportion of patients considered fit for operation, recent reports indicate that, by careful selection, a very reasonable operative mortality is possible (DeBakey et al. 1955, Farrar et al. 1956, Rob et al. 1956). There is no evidence that if aortography fails to show a thrombus within the sac, or if the mass does not increase in size, or if the aneurysm is small, that rupture is less likely, and therefore in the absence of contra-indications, operation should be undertaken as soon as possible after diagnosis. In patients who are first seen after rupture, there is little doubt that excision should also be attempted whenever possible (Javid et al. 1955, Farrar et al. 1956). There is adequate time for surgery in about 75% of these patients, and the prognosis without treatment is almost hopeless. Cooley (1955) has reported that 11 of 18 patients with ruptured aneurysms survived this operation.

Summary

51 cases of abdominal aortic aneurysm have been analysed in detail. With 1 possible exception, all the lesions were due to arteriosclerosis. The aneurysm arose from the aorta below the level of the renal arteries in 32 out of 34 cases.

The average age at diagnosis was 66 years. The sex incidence was 2 male to 1 female. 9 of the 10 patients aged 60 or less were males.

The symptomatology, including the syndrome of aneurysmal rupture, has been analysed and the causes of misdiagnosis discussed. The correct diagnosis of rupture was made in only 7 of 18 proven cases. 13 of these survived for twenty-four hours or longer following hospital admission. Before the onset of fatal rupture, 50% of patients were completely symptom-free and only 46% complained of abdominal pain. In about two thirds of these patients, the pain was of a characteristic colicky nature and was considered to be due to retroperitoneal leakage of blood.

Rupture was the cause of death in 23 of the 50 followed cases, while only 10 died from other cardiovascular disease. 16 of the 36 clinically diagnosed cases were dead from rupture in less than a year from diagnosis, while 73% of those followed three years or more died from rupture.

Surgical excision was considered to be the best treatment.

My thanks are due to the staff of the Royal Infirmary, Bristol, for permission to study their cases.

REFERENCES

Bahnson, H. T. (1954) *Circulation*, **9**, 494.
Blakemore, A. H. (1947) *Ann. Surg.* **126**, 195.
— Voorhees, A. B. jun. (1954) *Angiology*, **5**, 209.
Brindley, P., Stembridge, V. A. (1956) *Amer. J. Path.* **32**, 67.
Cooley, D. A. (1955) *Ann. Surg.* **142**, 621.
DeBakey, M. E., Cooley, D. A., Creech, O. jun. (1955) *J. Amer. med. Ass.* **157**, 203.
Dubos, C., Allary, M., Economos, N. (1952) *Arch. Surg., Chicago*, **64**, 405.
Epstein, J. (1945) *Ann. intern. Med.* **22**, 252.
Estes, J. E. (1950) *Circulation*, **2**, 259.
Farrar, T., Adson, M. A., Kirklin, J. W., Martin, W. J., Barker, N. W. (1956) *Proc. Mayo Clin.* **31**, 299.
Goldowsky, S. J. (1952) *R.I. med. J.* **35**, 604.
Hubeny, M. J., Pollack, S. (1940) *Amer. J. Roentgenol.* **43**, 385.
Javid, H., Dye, W. J., Grove, W. J., Julian, O. C. (1955) *Ann. Surg.* **142**, 613.
Kampmeier, R. H. (1936) *Amer. J. med. Sci.* **192**, 97.
King, R. C., Robinson, J. O. (1956) *Lancet*, i, 1047.
Maniglia, R., Gregory, J. E. (1952) *Arch. Path.* **54**, 298.
Nixon, J. A. (1911) *St. Bart's Hosp. Rep.* **47**, 43.
Pearlman, S. J. (1940) *Amer. J. Surg.* **49**, 518.
Rob, C. G., Eastcott, H. H. G., Owen, K. (1956) *Brit. J. Surg.* **43**, 449.
Scott, V. (1944) *Amer. J. Syph.* **28**, 682.
Uhle, C. A. W. (1941) *J. Urol.* **45**, 13.
Washburn, R. N., Wilbur, D. L. (1936) *Proc. Mayo Clin.* **11**, 673.
Wright, I. S., Urdaneta, E., Wright, B. (1956) *Circulation*, **13**, 754.
Zech, R. K., Merendino, K. A. (1954) *Amer. Surgeon*, **20**, 1150.

IDIOPATHIC STEATORRHŒA ASSOCIATED WITH SEVERE HYPOPROTEINÆMIA

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IDIOPATHIC steatorrhœa is often associated with deficiency of calcium, folic acid, vitamin B_{12} (cyanocobalamin), and iron, as the result of defective absorption. It is unusual, however, for protein absorption to be sufficiently impaired to lead to an appreciable fall in the level of the plasma-proteins. Cooke (1952) found that the plasma-proteins were less than 5 g. per 100 ml. in only 5 out of 90 patients with idiopathic steatorrhœa, and œdema was never the presenting symptom. In 12 cases reported by Friedlander and Gorvy (1955), the plasma-proteins were not reported, but œdema was never the mode of presentation.

Since the introduction of a gluten-free diet in the treatment of cœliac disease by Dicke (1950) and Weijers and van de Kamer (1950), the efficacy of the treatment has been well substantiated (McIver 1952, Gerrard et al. 1955, Ross et al. 1955). McIver (1952) reported a case of idiopathic steatorrhœa associated with anæmia and hypoproteinæmia treated successfully with a gluten-free diet, but in the other reported cases hypoproteinæmia has not been a feature.

The present report is of a patient, in whom there was slight impairment of fat absorption, presenting with gross œdema, due to hypoproteinæmia, and with tetany. The hypoproteinæmia was rapidly corrected by treatment with a gluten-free diet.

Case-report

A married woman, aged 31, was admitted to Whiston Hospital on Nov. 9, 1956. Three months previously she

first noticed swelling of the ankles and vulva, and the swelling had gradually increased and spread to the legs and thighs. During the previous three weeks she had been having attacks of painful spasms in the arms and hands several times each day. She also complained of lassitude, anorexia, and loss of weight. She did not complain of any bowel symptoms, but on specific questioning she admitted that her motions had been pale for several months, and that during the previous three weeks she had been passing three or four loose motions daily. She had had rheumatic fever at the age of 15, but no other previous illnesses. She had three healthy children and there was no significant family history.

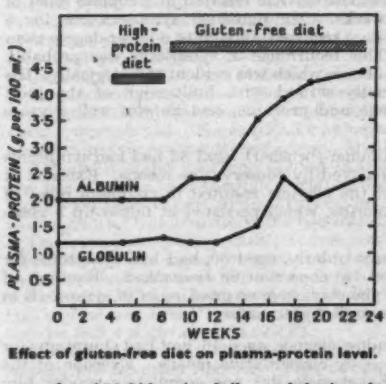
On examination, there was gross œdema of the legs, thighs, vulva, and back. Chvostek's sign was positive, and during the subsequent period of observation she had frequent attacks of tetany, involving the hands and arms. There were no other abnormal physical signs.

Investigations

Chest and barium-meal radiographs were normal. Films of the vertebræ and hands showed evidence of osteoporosis. The blood-count was normal. Plasma-proteins 3·2 g. (albumin 2·0 g., globulin 1·2 g.), serum-calcium 5·3 mg., serum-inorganic-phosphate 4·4 mg., serum-potassium 13·5 mg., serum-sodium 330 mg., serum-chloride 625 mg., serum-bilirubin 1 mg., serum-alkaline-phosphatase 15 King-Armstrong units, serum-amylase 160 units, thymol turbidity 4 units, and blood-urea 17 mg. per 100 ml. Urea-clearance test 76% of average normal, urine normal, and glucose-tolerance curve within normal limits. Fæces contained trypsin; fæcal fat content, 38 g. per 100 g. of dried fæces; fat-balance test over five days showed 89% fat absorption.

Treatment and Progress

The attacks of tetany were controlled initially by intravenous calcium gluconate. A month after admission, treatment was started with calciferol 100,000 units daily and calcium lactate gr. 80 daily. Within four days of starting this treatment the attacks of tetany ceased, and on the twelfth day of treatment the serum-calcium had risen to 7·8 mg. per 100 ml. The dose of calciferol was then increased to 150,000 units daily, and during the subsequent four months the level of the serum-calcium has been maintained between 8·7 and 9·7 mg. per 100 ml. The administration of calcium lactate was discontinued after two months.



Effect of gluten-free diet on plasma-protein level.

Treatment with a high-protein, low-fat, low-carbohydrate diet over a period of a month did not alter the level of the plasma proteins, and during this time the œdema increased and she gained 10 lb. in weight. On Jan. 6, 1957, treatment was started with a gluten-free diet. Within a month the œdema had practically cleared up, and she had lost 8 lb. in weight, though the plasma-proteins were only 3·6 g. per 100 ml. (albumin 2·4 g., globulin 1·2 g.). Three weeks later the œdema had completely gone; the plasma-proteins eventually rose to 6·8 g. per 100 ml. (albumin 4·4 g., globulin 2·4 g.) on April 17 (see figure). A further radiograph of the hands and vertebræ showed no change. During the period of observation she had been having two to three motions daily, and during the latter three months their colour had been normal.

Discussion

The presenting symptoms in idiopathic steatorrhœa are most often due to impaired fat and carbohydrate absorption, but in some cases there is no diarrhœa, and the presenting feature is deficiency of folic acid, vitamin B_{12}, iron, or calcium. Girdwood (1956) has described cases of megaloblastic anæmia in which folic-acid absorption is impaired but fat-absorption is normal, and the pathogenesis of this condition may sometimes be similar to that of idiopathic steatorrhœa. On the other hand, a review of the literature suggests that it is unusual for protein absorption to be seriously impaired. It may be, however, that some of the cases designated as idiopathic hypoproteinæmia (Binger and Keith 1937 Cope and Goadby 1935, Henneman and Albright 1955) are caused by impaired protein absorption.

Anæmia, either hypochromic or megaloblastic, is very often present in idiopathic steatorrhœa, yet in the present case, in which protein absorption was so severely impaired, the absorption of iron, folic acid, and vitamin B_{12} was sufficient to prevent anæmia. The considerable variation in the relative degree of absorption of fat, carbohydrate, vitamins, and minerals in idiopathic steatorrhœa remains unexplained.

An increase in this patient's protein intake had no effect on the plasma-proteins, and the subsequent rapid improvement while the patient was on a gluten-free diet is good evidence that the disordered function of the small intestine was induced by gluten. On the other hand, adequate absorption of vitamins and minerals can be obtained in the presence of gluten by the administration of large doses of these substances. In the present case the calcium deficiency was partially corrected, before treatment was begun with the gluten-free diet, by the administration of large doses of calciferol and calcium lactate by mouth.

Summary

A review of the literature suggests that impaired protein-absorption is unusual in idiopathic steatorrhœa, but a case is reported, with severe hypoproteinæmia and hypocalcæmia. Although protein-absorption was severely impaired, the absorption of iron, folic acid, and vitamin B_{12} was sufficient to prevent anæmia, and there was only slight impairment of fat absorption.

The rapid rise in the plasma-proteins while the patient was given a gluten-free diet is good evidence that the disordered function of the small intestine was induced by gluten.

My thanks are due to Dr. N. Bennett Jones for permission to publish this case, and to Dr. W. K. McGinley and Mr. Holland for carrying out the laboratory investigations.

REFERENCES

Binger, M. W., Keith, N. M. (1937). *J. Amer. med. Ass.* **109**, 1.
Cooke, W. T. (1952) *In* Modern Trends in Gastro-enterology, Edited by F. Avery Jones. London; p. 502.
Cope, C. L., Goadby, H. K. (1935) *Lancet*, i, 1038.
Dicke, W. K. (1950) M.D. thesis, Utrecht.
Friedlander, P. H., Gorvy, V. (1955) *Brit. med. J.* ii, 809.
Gerrard, J. W., Ross, C. A. C., Smellie, J. M. (1955) *Lancet*, i, 587.
Girdwood, R. H. (1956) *Quart. J. Med.* **25**, 87.
Henneman, P. H., Albright, F. (1955) *J. Lab. clin. Med.* **46**, 825.
McIver, C. (1952) *Lancet*, ii, 1112.
Ross, C. A. C., Frazer, A. C., French, J. M., Gerrard, J. W., Sammons, H. G., Smellie, J. M. (1955) *Ibid*, 1087.
Weijers, H. A., van de Kamer, J. H. (1950) Fat Absorption in Normal and Abnormal Infants and Children with Special Reference to Cœliac Disease. Utrecht.

"For a good many years now, there have been many attempts to answer the question: 'What is the best size for an all-purpose local authority?' . . . More than actual size, the character of the unit is important. If the area concerned is a true community its prospects of providing good health services are materially increased. Outside the dense industrial areas, the natural social pattern of this country is the local 'metropolis' surrounded by smaller towns and villages whose inhabitants have associations with the bigger town. They may work there, they probably shop there and they certainly go there for entertainment and recreation. Nothing could be more natural and sensible than for them to look there also for their social services. Our present local government system ignores this; the county borough is an island with people in its surrounding districts provided with social services from a distant county town with which they have no affinity at all. However efficiently the county may provide those services it can do so only by providing on the county borough's doorstep and sometimes even within its boundaries facilities which duplicate those already existing in the county borough."—Dr. J. D. KERSHAW, annual report of the medical officer of health for Colchester, 1956.

OPERATIVE TREATMENT OF ACROMIO-CLAVICULAR ARTHRITIS

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ACROMIO-CLAVICULAR arthritis is common. It is most commonly seen in men about the age of 40, rarely follows any major trauma, and is usually only mildly troublesome. The usual complaint is slight aching around the joint and local tenderness. In more serious cases there is severe pain in the region of the joint which may radiate down the arm. There is often secondary stiffness of the shoulder joint.

The severity of the symptoms is not directly proportional to the degree of arthritis present, but acute stage-1 osteo-arthritis must be very uncommon in the acromio-clavicular joint.

Conservative treatment, particularly short-wave diathermy and local infiltration of the joint with hydrocortisone and local anæsthetic agents, will relieve nearly all patients. There remains a small group whose symptoms persist despite long and repeated courses of treatment. They may be severely incapacitated, and are often forced to seek a more sedentary job.

Operative treatment is unpopular and usually involves an arthrodesis or pseudarthrosis. Arthrodesis of the joint is justifiably unpopular since it calls for immobilisation of the shoulder for a long period. The operation of pseudarthrosis is more promising. Six cases in which the outer end of the clavicle was excised are here reported and contrasted with six similar cases in which the acromion was excised. All twelve patients were men.

The Operation

The outer end of the clavicle is excised through a sabre-cut incision centred on the acromio-clavicular joint. The clavicle is divided with a sharp osteotome $^3/_4$ in. from the joint. The joint capsule is ringed with a knife and the loose fragment removed by sharp dissection. The muscle on either side of the resulting gap is sutured together, providing hæmostasis and discouraging the growth of new bone. The clavicle remains stable, because the coraco-clavicular ligaments are undisturbed. Postoperatively the arm is supported in a sling for 2 weeks, after which physiotherapy is started.

Acromionectomy is done by the method described by Armstrong (1949). The acromion is exposed by a sabre-cut incision centred on the acromio-clavicular joint. The acromion is totally excised by opening the joint and dividing the bone backwards in the line of the joint with an osteotome. The muscle is then dissected off the acromion in a retrograde manner. The free muscle edges are sutured together and to the soft tissue at the outer end of the clavicle.

Postoperatively the arm is supported in a sling for 2 weeks. After this, physiotherapy is started and continued for about 4 weeks.

As keloid formation is common in wounds around the shoulder-joint, these patients were given postoperative radiotherapy, with the result that keloid scars were not a problem.

Summary of Cases

Acromionectomy

CASE 1.—A college secretary, aged 32, had had symptoms for a year not relieved by conservative treatment. Frozen shoulder developed during treatment. After acromionectomy, he had no disability and full function at a 3-year follow-up.

CASE 2.—A grate builder, aged 40, had had symptoms for 2 years, only temporarily relieved by conservative treatment; he was forced to take light work before operation. 3 months after acromionectomy, he was symptom-free and back at work. He was well 2 years later.

CASE 3.—A builder, aged 44, had had symptoms for 3 years, only partially relieved by conservative treatment. Five months after acromionectomy he was symptom-free, and he was still well 3 years later.

CASE 4.—A window-cleaner, aged 45, had had mild symptoms for 3 years, much worse for 6 months. Acromionectomy gave relief of symptoms in 2 months, but he preferred to carry his ladder on his unaffected shoulder as the scar was somewhat sensitive. Well 3 years later.

CASE 5.—A coalminer (stripper), aged 46, had had symptoms for 6 months unrelieved by conservative means. After acromionectomy, he returned to full work in 2 months and was well 3 years later.

CASE 6.—A tobacconist and newsagent, aged 44, had had symptoms for a year unrelieved by conservative means; a keen golfer, but had to give it up as it much aggravated the pain. Acromionectomy gave relief in 2 months; he was playing golf in 4 months, and well 3 years later.

Excision of Outer End of Clavicle

CASE 1.—A policeman, aged 50, had had symptoms for 3 years only temporarily relieved by conservative means. Excision of the lateral end of the clavicle resulted in relief of pain in 2 months; he was well 2 years later.

CASE 2.—A Civil Servant (clerk), aged 40, had had symptoms for 4 years unrelieved by conservative means. Excison of the lateral end of the clavicle did not relieve him at any stage. There was a tender scar with involvement of the lateral supra-clavicular nerve. Section of the nerve partially relieved his symptoms but he declined acromionectomy when this was offered. Follow-up was 8 months.

CASE 3.—A builder's labourer, aged 38, had had symptoms for 9 months unaffected by conservative treatment. Excision of the lateral end of the clavicle resulted in complete relief of symptoms in 6 weeks. He remained symptom-free for 6 months, but then pain recurred, though to a lesser degree than preoperatively. This recurrence of symptoms was probably due to regrowth of bone, which was evident radiologically. His symptoms eventually settled with infiltration of the joint with hydrocortisone and procaine, and he was well 2 years after operation.

CASE 4.—A coalminer (brusher), aged 52, had had symptoms for 8 months, unrelieved by conservative means. Excision of the lateral end of the clavicle resulted in complete relief of symptoms in 2 months, which persisted at follow-up 3 years later.

CASE 5.—A street orderly, aged 50, had had symptoms for 2 years unrelieved by conservative treatment. Excision of the lateral end of the clavicle gave great relief of symptoms in 3 months. He was well 2 years later.

CASE 6.—A window-cleaner, aged 46, had had symptoms for 2 years, unrelieved by conservative means. Excision of the lateral end of the clavicle did not completely render him symptom-free; 2 years later he continued to have pain in the region of the joint towards the end of the day, and could not carry his ladder on the affected shoulder.

Thus, in this series the results of excision of the outer end of the clavicle were inferior to those of acromionectomy, and the operation should probably be abandoned in favour of acromionectomy.

Acromionectomy is by no means a small operation, and is usually accompanied by much bleeding. Hypotension anæsthesia facilitates the procedure, and was used in all cases except one.

Summary

Of twelve cases of acromio-clavicular arthritis requiring operation six underwent acromionectomy and six excision of the lateral end of the clavicle.

The results of acromionectomy were superior to those of excision of the lateral end of the clavicle in this series.

These patients were under the care of the orthopædic surgeons of the South East Scotland Region, who have kindly permitted me to publish.

REFERENCE

Armstrong, J. R. (1949) *J. Bone Jt Surg.* **31B**, 436.

CLOSTRIDIUM WELCHII INFECTION FOLLOWING CHOLECYSTECTOMY

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GAS-GANGRENE infection is commonest in heavily contaminated and severely contused wounds, particularly war wounds, but it may also complicate elective surgery, either from inoculation of a necrotic nidus in the wound from the air, instruments, or dressings in the operating-theatre (Sevitt 1953), or, less rarely, from the liberation of *Clostridium welchii* and related organisms contained within the alimentary tract or biliary system.

Such infections are fortunately uncommon; but unless they are borne in mind their very rarity may lead to delays in diagnosis and treatment.

The following case-report records a *Cl. welchii* infection after cholecystectomy; it was recognised and treated early, and the patient survived.

Case-report

A radio engineer, aged 35, was admitted to the Radcliffe Infirmary for cholecystectomy. He had been healthy except for several attacks of typical acute cholecystitis over the previous six years. In no attack had he been jaundiced. Clinical examination revealed no abnormality save obesity. A cholecystogram showed that the gall-bladder filled with dye but contained many stones.

On Aug. 10, 1956, the abdomen was explored through a right paramedian incision. The gall-bladder was thick-walled and contained multiple stones. The ducts, and other abdominal viscera, were normal. The gall-bladder was removed, with separate ligation of the cystic duct and artery. Diathermy hæmostasis of the gall-bladder bed was carried out, and a tube drain was passed down to it through a stab incision. The abdomen was closed with catgut to the peritoneum and nylon to the rectus sheath. Unfortunately, the bile was not sent for culture.

The immediate postoperative course was satisfactory, but after twenty-four hours the pulse-rate began to rise and the patient looked pale and ill. Three hours later, his pulse-rate had risen to 160, his blood-pressure had dropped to 90/50 mm. Hg, and he was toxic, restless, anxious, and disoriented; by now he had a slight pyrexia (99°F).

The abdomen at this stage was tender in the region of the wound, but no other abnormal physical signs were detected. Because of the severity of the collapse in the absence of evidence of intra-abdominal hæmorrhage, a diagnosis of a postoperative fulminating infection was made, and it was decided to re-explore the abdomen. Two pints of blood were transfused preoperatively.

The wound was re-opened under general anæsthesia thirty hours after the initial operation. Immediately the musty smell of gas gangrene could be detected, and there was thin yellow pus with bubbles of gas both in the abdominal wall and within the peritoneal cavity. The liver was swollen and bright red; there had been no intra-abdominal bleeding.

Swabs of pus and pieces of tissue from the abdominal wall were sent to the laboratory for urgent examination; the wound was swabbed out with hydrogen peroxide and closed with figure-of-eight tension sutures of nylon. Corrugated drains were inserted through the upper and lower ends of the wound.

Intramuscular penicillin, a million units four-hourly, and streptomycin, 1 g. twice daily, were begun and continued for ten days. Polyvalent anti-gas-gangrene serum (containing 10,000 units *Cl. welchii*, 5000 units *Cl. septicum* and 10,000 units *Cl. œdematiens* antitoxin in each dose) was given transvenously six-hourly for forty-eight hours.

By the end of the operation the preliminary report on the pus was available; the films strongly suggested a clostridial infection. Subsequent cultures from pus and tissues grew *Clostridium welchii* and a penicillin-sensitive *Staphylococcus aureus*. Histological examination of a small piece of muscle taken from the abdominal wall revealed coagulation necrosis, with separation of the muscle-fibres from their sarcolemmal sheaths; clostridia could be seen in the interstitial tissue.

The day after the second operation the patient remained confused and toxic (temperature 99°, pulse-rate 120 a minute), but within forty-eight hours he was obviously improving. He was afebrile by the fifth day. He was discharged home with the wound soundly healed twelve days after operation.

When last seen on June 3, he had gained weight and was free from symptoms, and there was no evidence of incisional hernia.

Discussion

There have been several reports of gas-gangrene infections following abdominal surgery. The great majority of infections seem to be due to liberation of clostridia from the alimentary tract or biliary system since, in nearly all the reported cases, the stomach, duodenum, (Quinn et al. 1942a) intestine, or gall-bladder (or its ducts) had been opened.

Thus, Quinn et al. (1942b), reviewing 48 operations complicated by gas gangrene of the abdominal wall, found that 21 followed surgery of the appendix, 17 bowel-drainage operations (such as colostomies and ileostomies), 2 gastric operations, and 1 the repair of a ventral hernia, in which, possibly, a loop of bowel might have been injured. The remaining 7 cases followed gall-bladder surgery.

Eliason et al. (1937) reported 38 cases of gas gangrene following abdominal surgery. 12 of these followed operations on the gall-bladder, 1 infection being confined to the abdominal wall, and the other 11 to the abdominal cavity. Of the remaining 26 cases, all but 4 followed operations in which the bowel had been opened, the exceptions being 2 hernia repairs and 2 salpingectomies. Brown and Milch (1948), recording 6 fatal cases of clostridial infection following cholecystectomy, found that 2 patients had massive infections of the gall-bladder bed and abdominal wall, in 2 the liver was involved, and in 2 intra-abdominal abscesses developed containing *Cl. welchii*.

Since gas-gangrene infection after abdominal surgery nearly always follows alimentary or gall-bladder operations, the majority probably represent auto-infection from gas-gangrene organisms already present in the bowel or biliary system. Clostridia can almost invariably be recovered from normal stools (Wilson and Miles 1955) and may also be found, though less often, if bile, gall-bladder wall, or even gallstones are cultured anaerobically. Gordon-Taylor and Whitby (1930), for example, obtained 9 positive cultures in 50 consecutive cholecystectomy specimens, Thorsness (1934) recovered clostridia from 5 of 75 human gall-bladders (7%), and Andrews and Henry (1935), examining 91 specimens, found that 11% of the gall bladders and 9% of the contained bile grew *Cl. welchii*.

Routine chemotherapy after cholecystectomy has been advised by Ryan et al. (1953). We do not feel that the very small risk of clostridial infection justifies this; but we submit that surgeons should be aware of this rare complication of a common operation, and that if collapse and toxæmia follow rapidly after cholecystectomy, gas-gangrene infection should be considered.

Summary

Clostridium welchii infection, though usually thought of as a complication of penetrating major wounds, may follow abdominal operations, especially when either the alimentary or the biliary system has been opened. A case is recorded of gas gangrene following a routine cholecystectomy. Gas gangrene should be considered when profound toxæmia and collapse follow abdominal surgery.

REFERENCES

Andrews, E., Henry, L. C. (1935) *Arch. intern. Med.* **56**, 1171.
Brown, R. K., Milch, E. (1948) *Gastroenterology*, **10**, 626.
Eliason, E. L., Erb, W. H., Gilbert, P. D. (1937) *Surg. Gynec. Obstet.* **64**, 1005.
Gordon-Taylor, G., Whitby, L. E. H. (1930) *Brit. J. Surg.* **18**, 78.
Quinn, W. C., Lord, J. W., Wade, L. J. (1942a) *Surgery*, **11**, 229.
— — — (1942b) *Ibid*, p. 233.
Ryan, E. A., Harrigan, E., Penny, S. F. (1953) *Canad. med. Ass. J.* **69**, 606.
Sevitt, S. (1953) *Lancet*, ii, 1121.
Thorsness, E. T. (1934) *Surg. Gynec. Obstet.* **59**, 752.
Wilson, G. S., Miles, A. A. (1955) Topley and Wilson's Principles of Bacteriology and Immunity. London.

TEMPORAL-LOBE EPILEPSY ASSOCIATED WITH SEVERE BEHAVIOURAL DISTURBANCES

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APART from the well-recognised functions of hearing (superior temporal convolution) and olfactory and gustatory sensibility (uncus and amygdala), the temporal lobes, the second largest in the brain, appear also to be concerned with the autonomic nervous system, memory, judgment, and affective behaviour.

In the present case a boy, now aged 15, developed major and minor epilepsy, apparently due to an injury which he received at the age of 16 months. With his fits there was severe behaviour disorder, seemingly precipitated by environmental factors and often so ferocious as to resemble the experimental sham rages seen in animals.

Case-report

The patient was the eldest of four children. Both parents were alive, and there was no familial history of epilepsy, alcoholism, or organic disease. The family lived in an eight-room house with maternal grandparents, uncles, and aunts. The home appeared to be clean and adequate, and the patient had a room of his own. The father was out of work for long periods, plausible, unreliable, and autocratic. He was a long-distance lorry-driver and, when away from home, would consort with other women, and on various occasions had left home. Rows in the house were frequent and severe, the husband reacting to criticism with indignant rages. The patient strongly identified himself with his father and looked on temper as a sign of strength. To quote his mother: "The marriage has certainly not been a happy one, and my son could not help being aware of the domestic tension and strain."

Apart from measles without complications the patient had had no illnesses, and his birth and early development were normal. At the age of 16 months he fell downstairs and was taken to hospital with "concussion and convulsions." He was discharged after ten days apparently well. At the age of $2^1/_2$ years he started in kindergarten, and the staff reported that he would behave well only if his misbehaviour was ignored. Severe temper tantrums began at the age of $5^1/_2$ years with what appear to have been petit-mal attacks. At the age of 9 years he had his first major convulsion with an outburst of rage. He was admitted to hospital, where his Wassermann reaction, cerebrospinal fluid, electro-encephalograms, and skull radiograms were found to be normal. A tonsillar infection on admission was thought to be the cause, and he was discharged on small doses of phenobarbitone. From this time he was subject to outbursts of rage after provocation or frustration, which were followed by face-pulling and incontinence. He was also reported to have recurrent attacks in which he suddenly went pale and stared into space, with twitching of hands and mouth. Petit mal was diagnosed, and he was given troxidone ('Tridione') in addition to the phenobarbitone. Six months later he was referred to a child-guidance clinic because of the increased frequency and violence of his rages. He was now attacking people other than the family and had made a determined attempt to strangle a girl at school. The mother stated that it was impossible to appreciate the degree of violence of which her son was capable "in one of his moods." The clinic authority suggested that his outbursts of temper were at least aggravated by environmental factors, and that some of his violent episodes could well be neurotic, especially in view of the normal electro-encephalograms, the poor response to troxidone, the absence of a family history of epilepsy, the fact that frustration appeared to precipitate the attacks, and the fact that the father's neurosis at times took the same form.

The child's I.Q. at that time was 104, and the thematic apperception test showed aggressive loading and identification with the father. He underwent further electro-encephalography in October, 1951, and this showed low-amplitude slow activity in the right postcentral cortex, increased by hyperventilation. During the recording the boy had an epileptic fit and lost consciousness, his head turning to the left and his eyes staring fixedly upwards, and the record showed the attack to start in the right parieto-occipital cortex. Pneumo-encephalography in January, 1952, showed a slight dilatation of the ventricular system, rather more on the left than the right. The boy returned home still on anticonvulsants but with no alteration in either fits or rages. He had almost daily outbursts of violence, attacking his mother on one occasion with an axe, and biting and kicking people on the street with little or no provocation. The police were called in several times to deal with him. In August, 1954, he was admitted to an epileptic colony, but he soon attacked the matron and staff with scissors and knives and could not be controlled with sedation. His parents were asked to remove him, but on returning home he locked the family in the kitchen and later attacked his mother with a hammer and threw a knife at his grandmother. From the history it appeared that a great number of his outbursts could not be explained as automatisms.

Admission.—He was admitted to Winwick Hospital in September, 1954, when on examination nothing abnormal was found clinically, and skull and chest radiographs were normal. The electro-encephalograms, however, were grossly abnormal, maximally on the right side, and during an attack similar to the one previously reported the onset was seen to be in the right temporal lobe. Further assessment by psychological testing showed no signs of intellectual deterioration, but projective techniques suggested a possible link between his behaviour and the home environment, but nothing more definite than this.

Operation.—A right temporal lobectomy was done in December, 1954, the excision including the anterior 5–6 cm. of the lobe and the amygdaloid nucleus.

Postoperatively, the boy became more coöperative and less negativist, and his behaviour had so dramatically changed that he was discharged home early in January, 1955. He had already been placed on anticonvulsants, but even though he returned to the same tense domestic atmosphere he was much more stable and normal. When a vacancy arose he was placed in a school for maladjusted boys, being allowed frequent periods of leave.

Follow-up.—Electro-encephalography in February, 1955, was almost within normal limits for his age, and the bilateral synchrony present in previous recordings had disappeared. He has had no fits, either grand mal or petit mal, since the operation, and his behaviour continues stable. Reports from his school show that he still reacts to frustration with agression, but this appears to be less and less in evidence. He is accepted as a leader by the other boys and won a medal last summer for being the best athlete in the school sports. He is top of his class, shows much initiative and ambition, and is eager to start an apprenticeship as an electrician. He has been off anticonvulsant drugs completely for some months now. He has also been tested frequently over the past few years to see if there is any residual damage to his learning ability or his ability to deal with auditory or visual symbols in learning, and all tests have been negative, but this is now the established finding in cases where the non-dominant lobe is removed (Mayer and Yates 1955).

Pathology.—A section of the removed lobe revealed no focal or diffuse lesion of nerve-cells and no signs of a pathological focus. It was suggested, however, that other parts of the lobe might well be diseased or else the lesion might be physio-pathological.

Discussion

Temporal-lobe epilepsy is certainly commoner than was formerly thought. Gibbs (1951) considers that a third of all epilepsy originates in the temporal lobe, and Gibbs et al. (1948) estimate that about half the patients with such epilepsy exhibit personality disorder. The present patient developed many features of temporal-lobe epilepsy, but the diagnosis rested in the main upon the abnormal electro-encephalograms. Morris (1956) holds that arteriograms and pneumo-encephalography are of limited value in such cases, and that the important diagnostic procedure is electro-encephalography. The most impressive feature of the present case, however, was the liability to outbursts of rage which became so ferocious that it was feared that the patient might kill somebody. These completely cleared after operation and the electro-encephalograms simultaneously returned

to normal. Such a sequence appears to be unusual in most of the published cases. Unusual features were the presence of petit mal of some standing and the absence of a true aura, both of which worsen the prognosis (Morris 1956). It may be argued that the presence of the abnormal focus facilitated this patient's release of emotional behaviour, but the evidence suggests that the basic pathology lay in the abnormal patterns established by such a focus, environmental factors only precipitating the attacks. The focus appeared to be the triggering off mechanism for discharges throughout the complex—hypothalamus, anterior thalamic nuclei, gyrus cinguli, and hippocampus—and the clinical manifestations can be followed in the light of modern anatomical and physiological evidence.

Although it is not suggested that outbursts of temper coupled with abnormal electro-encephalograms are best treated by lobectomy, states of severe antisocial behaviour with a well-defined focus, as in the present case, are best treated by operation. If left unheeded, such a focus is, in time, liable to establish secondary foci in other parts of the cortex.

I wish to thank Dr. G. J. Harrison, medical superintendent, Winwick Hospital, and Mr. Sutcliffe Kerr for permission to publish, and Mrs. Una Holden and Dr. P. M. O'Flanagan for assistance in the preparation of this article.

REFERENCES

Gibbs, E. L., Gibbs, F. A., Fuster, B. (1948) *Arch. Neurol. Psychiat.* **60**, 331.
Gibbs, F. A. (1951) *J. nerv. ment. Dis.* **113**, 522.
Mayer, V., Yates, A. J. (1955) *J. Neurol. Psychiat.* **18**, 44.
Morris, A. A. (1956) *Arch. Neurol. Psychiat.* **76**, 479.

New Inventions

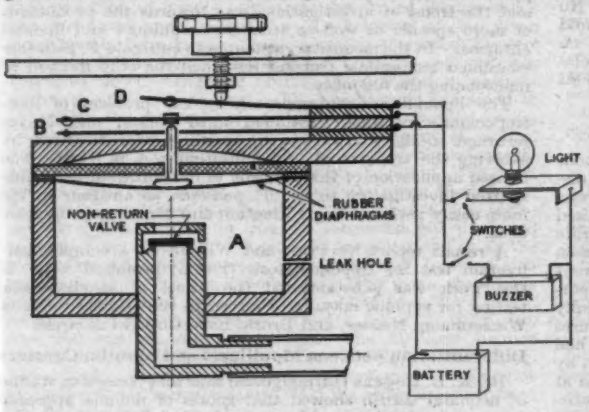
ALARM UNIT FOR USE WITH INTERMITTENT POSITIVE-PRESSURE-RESPIRATION CIRCUITS

IT is now generally agreed that combined respiratory-muscle failure and pharyngeal paralysis requiring artificial ventilation by intermittent positive pressure (I.P.P.R.) demands the continuous presence of a special nurse.

A machine failure, circuit obstruction, or leakage may be so rapidly fatal that the few seconds saved by earlier recognition may be life-saving. The development of the East-Bates alarm unit helps to save these seconds. It is not intended to replace the special nurse, but only to give her earlier warning of circuit disorders.

Much of the credit for the development of this alarm must go to Mr. Paul Bates, a poliomyelitis patient requiring continuous I.P.P.R. His experiences over two years, in which time there were various unavoidable machine and circuit failures convinced him of the need for a reasonably inexpensive yet reliable alarm signal.

The unit, measuring 5 × 5 in. and weighing 2½ lb., gives visible and audible warning of circuit disorders. It is incorporated into the circuit at a point as near the tracheotomy tube as is convenient.



Plan of the East-Bates alarm unit.

During inspiration air enters the chamber (A) through a short pressure-tubing connection from the main circuit, and the increase of pressure within this chamber raises the rubber diaphragm on its upper surface which in turn lifts the movable electrode (C). The position of the electrode (D) is preset by the control so that electrodes (C) and (D) will not make contact unless the required pressure is exceeded and thus raises (C) higher than normal. During expiration the air in chamber (A) escapes through the leak-hole and electrode (C) returns to its original position. If there is a leak in the circuit this electrode will fall to such an extent that it will make contact with the fixed electrode (B). In either case, when contact is made, the alarm will ring until the failure is corrected.

The alarm will give warning of two of the commonest disorders encountered when using an I.P.P.R. circuit:

(1) *Increase of pressure from obstruction in the circuit.*
(*a*) In the connecting-tubes by water, kinking, or compression.
(*b*) In the tracheotomy tube or trachea, by mucus.
(*c*) In the lungs as a result of collapse.

The electrode (D) can be so adjusted that a rise in pressure of 3 cm. water, between an operating range of 7 cm. and 25 cm., will cause the alarm to sound intermittently until the cause is rectified. A finer adjustment than this was found to be unsatisfactory as minor variations in pressure are to be expected and are unlikely to be repeated for more than a few breaths.

(2) *Decrease of pressure.*
This may be due to:
(*a*) Failure of pump.
(*b*) Disconnection of some part of the circuit.
(*c*) Displacement of the suction cap of the Cobb's union.
(*d*) Under certain circumstances the alarm will sound when there is a small leak in the circuit, such as might be caused by deflation of the cuff of the tracheal tube (see later).

The alarm unit was tested with variations of pressure, tidal air, and rate while using a Radcliffe pump in an experimental circuit. Under these circumstances it was found that the alarm operated satisfactorily between pressures of + 7 cm. and + 25 cm., giving tidal airs, in this circuit, of between 100 cc. and 710 c.cm. at rates of between 15 per min. and 37 per min.

Very delicate adjustment was possible to indicate rise of pressure. In the experimental circuit it was observed that a rise of 2 cm. was constantly signalled. The lower the operating-pressure, the more effective was found to be the leak alarm. As the pressure increased, so did the leak required to operate the alarm. Thus, at high pressures, deflation of the tracheal cuff was not signalled; but at all pressures removal of the suction cap of the Cobb's union caused the alarm to sound within 8 seconds.

The alarm unit, with water trap, was also incorporated into the I.P.P.R. circuits of three patients requiring tidal airs varying between 150 c.cm. and 600 c.cm. Either the Clevedon (gas-operated) or the Radcliffe (electrically operated) pump, with humidification, was used. On some occasions warning was given of circuit leaks and, particularly, the need for tracheal suction before the attendant nurse had recognised the fault.

The alarm was run continuously for a week with full humidification at a rate of 20 per min., tidal air 300 c.cm., and pressure 10 cm. At no time did it fail to indicate disorders. It was then dismantled and examined.

Slight condensation was present in the connecting-tubes and pressure-chamber, but this was not sufficient to impede air-flow. The inlet-opening and leak-hole were fully patent. The electrodes showed no corrosion. The battery, which had been used intermittently for 3 months, retained ⅔ of its original charge.

The East-Bates alarm unit is manufactured by H. G. East & Co. Ltd., 37, Oxford Road, Cowley, Oxford.

My thanks are due to Dr. G. D. W. McKendrick for his advice during the preparation of this report.

St. Ann's General Hospital, Tottenham, London

J. M. MEDLOCK
M.B. Lond.

Medical Societies

ASSOCIATION OF CLINICAL PATHOLOGISTS

THE 59th general meeting of the association was held in London on Sept. 26–28. The proceedings included symposia on exfoliative cytology and iron metabolism (jointly with the Association of Clinical Biochemists). We publish here short accounts of some of the papers.

Chordoma

Prof. T. CRAWFORD (London) discussed 7 cases of chordoma seen in the pathology department at St. George's during the past eight years. 3 involved the sacrum, 2 were intracranial, and 2 spinal. In both the spinal cases, the lesions affected the dorsal region, which is the least commonly involved part of the spine. One of the patients with sacral chordoma died with multiple metastases in the lungs.

Chordoma was often misdiagnosed as chondrosarcoma, and a study of the staining reactions was undertaken to try to find some clear distinguishing feature. The histochemical reactions of the ground substance of the two tumours were remarkably similar. In both tumours the ground substance stained feebly with the periodic-acid/Schiff reaction, was metachromatic with toluidine blue, and stained with other mucin stains such as mucicarmine and alcian blue. In both tumours also the ground substance gave a low value (below pH 3) for the methylene blue extinction test. These reactions were those of an acid mucopolysaccharide of connective-tissue type and afford no distinguishing feature between tumours of cartilaginous and notochordal origin.

The occurrence of chordomatous metastases in the lung in one case enabled a direct comparison in the same sections between the normal cartilage of the bronchial wall and the ground substance of the metastasis. The only staining reactions which showed any clear distinction were the reticulin stain, which gave a rather diffuse deposit in cartilage but left chordomatous matrix unstained, and Mallory's phosphotungstic-acid/hæmatoxylin method, which stained cartilaginous matrix a reddish-brown tint but again left the chordal tissue unstained. It was interesting that tissues of such different embryological origin as cartilage and notochord, but with similar function, should produce a mucinous substance with such similar histochemical characteristics.

Blood Coagulation, Post-prandial Lipæmia, and Coronary Thrombosis

Dr. J. R. O'BRIEN (Portsmouth) had compared 21 men aged 40–60 years with coronary thrombosis with 21 normal men of the same age. Tests were performed before and four hours after a selected fatty meal. The tests, including two new tests, the plasma phospholipid-clearing power and the heptaine-accelerated 'Stypven' time, measured some physical, physicochemical, chemical, and coagulant properties of the blood. Postprandial changes were found in both groups in many tests, including a highly significant shortening of the clotting-time of whole blood in the presence of powdered glass, while the shortening of the clotting-time in glass and in silicone-treated glass was significant only at a 5% level. No significant differences between the two groups were found either before or after the meal. These findings lend no support to the suggestion that postprandial hypercoagulability is responsible for the alleged connection between the fat content of the diet and coronary thrombosis.

Sterilisation of Syringes

Dr. E. M. DARMADY (Portsmouth) discussed the methods of sterilisation in present use in syringe services. The disadvantage of steam sterilisers (apart from their expense) was that it was doubtful whether syringes could be sterilised assembled in containers so that steam may freely penetrate to all surfaces. The conventional hot-air ovens had been shown to have great variations in temperatures in different parts, and even with heat distribution by a fan, it was important that the load should be very limited and very carefully arranged. The time taken to reach adequate temperatures was also too long. Dr. Darmady and his co-workers had therefore designed an assembly for continuous sterilisation by means of infra-red heat, using 2-kilowatt projectors placed at intervals over a moving belt. This had proved highly satisfactory, and careful thermocoupled tests have shown that 2-ml. syringes with suitable dull aluminium or anodysed metal containers, would reach adequate temperatures in 3 to 4 min., 20 ml. syringes taking slightly longer.

Bacteriological experiments revealed that no guaranteed sterilisation could be achieved if temperatures no higher than 160°C were reached, even over as long as 22½ minutes. Only occasional failures were noted with temperatures between 160°C and 180°C. In the third group, when temperatures of 180°C were reached, all the tests were sterile. It was recommended, therefore, that a temperature of 180°C or more should be maintained for 11 minutes.

Cytology of Serous Fluids

Dr. A. I. SPRIGGS (Oxford) illustrated the diagnosis of malignant disease from smears of deposit of serous fluids. Three methods were commonly used for this examination—sections of centrifuged deposit, wet-fixed films stained by hæmatoxylin and eosin, or by Papanicolaou's method, and air-dried films stained with Romanowsky stains. If only one method was to be used, the air-dried film was preferable; not only did it give excellent nuclear and cytoplasmic detail, but the spread-out cells appeared larger and differences in their nucleocytoplasmic ratio were accentuated. Difficulties in the identification of malignant cells were sometimes technical, but even in perfect conditions the slides could be difficult to interpret. Dr. Spriggs gave examples of the main pitfalls—atypical mesothelial cells and macrophages, occasional stem cells, and cells in mitosis, all occurring in non-malignant effusions. The cells of oat-cell carcinoma were very characteristic, with extremely scanty cytoplasm and a tendency for adjacent nuclei to assume a mosaic or honeycomb appearance. "Doubtful" reports on serous fluids were of no use to the clinician, and a positive report should be made only when there was virtual certainty.

Cytology of Urinary Tract

Dr. J. G. S. CRABBE (London) showed smears from urine demonstrating differences between normal epithelium from the whole of the urinary tract and suspicious-looking malignant cells. In industrial workers (particularly those in the dye-stuff industry) exposed to bladder carcinogens, it was important that routine examinations, including microscopic examinations for red blood-cells and malignant cells, be carried out at regular intervals, and in this way cases had been diagnosed at the earliest possible moment.

Progress of Serological Tests for Syphilis

Dr. I. N. ORPWOOD PRICE (London) remarked that the sidetracking of serologists from the immunological procedure of Wassermann, Neisser, and Bruck seemed to be due to the inability to grow *Treponema pallidum* in artificial media and to the unique discoveries of Marie, Levaditi, and Weygand followed by those of Landsteiner, Mueller, and Poetzl. These workers demonstrated that watery and alcoholic extracts of normal animal tissue used as antigens gave as highly specific and more sensitive results as Wassermann antigen when used in the serodiagnosis of syphilis, and this work appeared to dominate the whole pattern of research for over forty years. But even at the outset these tests resulted in a small proportion of non-treponemal reactions which troubled workers and the trend of investigations was towards the production of more specific as well as sensitive techniques and lipoidal antigens. In the meantime, attempts to cultivate *T. pallidum* continued but animal transfer remained the only method of maintaining the organism.

The lipoidal antigen approach to the problem of non-treponemal reactions continued until Nelson and Mayer returned to the fold of specific serodiagnostic reactions by evolving the treponemal immobilisation test in 1949. The limited application of this test due to difficulties of technique spurred investigators to use *T. pallidum* as antigens in the more easily performed agglutination and complement-fixation tests.

A recent report by Price and Whelan on a complement-fixation test for treponematosis (T.W.R.) promised well. If this work was substantiated the wheel of serodiagnostic testing for syphilis may, by a return to the original thesis of Wassermann, Neisser, and Bruck, have turned full circle.

Differentiation between Moniliasis and Monilia Carriers

Dr. K. B. ROGERS (Birmingham) said that American studies of neonatal thrush showed that spores of monilia appeared first and hyphæ later, a day or so before clinical thrush was

found. Routine examinations at the Birmingham Children's Hospital had shown that hyphæ could be found in the material from any site invaded by monilia; it was probable, therefore, that their presence could be used to decide whether the *Candida albicans* was present as a pathogen. Such a decision would be of great value, since the specific therapy of moniliasis was different from that of bacterial infections. Babies on neomycin never developed intestinal or cutaneous moniliasis though their fæces contained many spores, but no hyphæ, of monilia. Similar findings in other sites had been associated with a monilial carrier state. The large gram-positive hyphæ and spores of monilia had a distinct morphology so that they were easily found with the 2/3 objective; stained smears need a liberal application of immersion oil or mounting under a cover slip. Smears made twenty-four hours after the specimen was received may show only spores. Trichosporon may be a misleading contamination in a non-catheter specimen of urine.

This hypha formation was first noticed in the urine of a girl who developed a monilial cystitis when recovering from anuria. The fæces of another girl, with severe gastro-enteritis, always showed these monilial hyphæ and until treated for moniliasis, she remained ill. Other cases of monilial enteritis have shown these hyphæ, and hyphæ have also been seen when there has been monilial infection of operative wounds, external otitis, vaginitis, and conjunctivitis in the newborn.

Iron Metabolism

Dr. DAVID MARRACK (London) said that in man the iron stores contained about 1 g. of iron in the form of ferritin and hæmosiderin, which was probably an insoluble aggregate of ferritin molecules. Ferritin consisted of a protein, apoferritin, which was synthesised as and when there were iron atoms to be stored. The iron was stored in this protein as a special hydroxide complex and up to 20% iron may be present. The serum-iron was attached to the special plasma-protein, siderophyllin, in the ferric state, 2 atoms per molecule of protein. There was considerable diurnal variation in the serum-iron level; it was highest in the early morning.

In the absence of anæmia, approximately two-thirds of the total body iron, which amounted to 3–5 g. in the adult, was bound in the hæmoglobin mass. 1% of this hæmoglobin mass was destroyed each day in the reticulo-endothelial system. Free bilirubin and iron were discharged into the circulation and the latter was promptly bound to the siderophyllin. To maintain the hæmoglobin mass 27 mg. of iron were drawn from the serum-iron every twenty-four hours by the erythron. The serum-iron pool of about 0·005 g. was turned over six times per twenty-four hours. By labelling this pool with radioactive ^{59}Fe it was possible to study the kinetics of this turnover, and that of the hæmoglobin could also be followed. Owing to the several important assumptions made in these calculations their clinical interpretation was difficult.

Absorption of Iron from the Alimentary Tract

Dr. MARY SMITH (London) said that a review of the literature concerning the site of absorption of iron, the type of iron available for absorption, and the total amount which can be absorbed, revealed that some of the difficulties in the interpretation of results arise from the varied dosage which has been used and the fact that the amounts of iron given have mostly been large. The absorption of graded doses of ferrous sulphate containing 1 μg. to 100 mg. of iron was therefore tested serially in normal humans and in patients with iron-deficiency anæmia. The results were examined to determine the optimal dose for absorption tests and to see whether any light was thrown on the amount of control exerted on iron absorption by the "mucosal block" mechanism. Each dose was labelled with 1 μc. of ^{59}Fe, and ascorbic acid was added. The dose was given fasting and fæces were collected subsequently and counted for radioactivity. The fraction of iron not recovered was presumed to have been absorbed. There was great variability in the proportion absorbed between individuals and between successive tests in the same individual. The mean percentage absorption for each group was 35%, 33%, 30%, 21%, 17%, 16%, 15%, and 10% for doses of 0·001, 0·1, 1, 5, 10, 20, 50, and 100 mg. of iron respectively. The absolute amount absorbed was 0·0003, 0·033, 0·3, 1·1, 1·7, 3·2, 7·5, and 10 mg. respectively. The pattern in iron deficiency was similar but at higher levels and a mean of 34·5 mg. was absorbed from the 100 mg. dose.

Thus, although there was a trend towards diminished proportional absorption with increasing dosage, the absolute amount absorbed steadily increased. A dose of 10–20 mg. seemed desirable for further tests. Since this amount was close to physiological intake and gave good percentage absorption yet avoided the wide scatter of smaller doses. The absence of any threshold of absorption suggested that the mucosal acceptor mechanism did not limit the absorption of iron over the range tested.

Uptake of ^{59}Fe by Mammalian Red-cell Precursors

Dr. L. G. LAJTHA (Oxford) reported that, using high-resolution autoradiography, the uptake pattern of ^{59}Fe into nucleated red cells of human bone-marrows in vitro and of rabbit bone-marrows in vivo was investigated. Uptake was noted by the earliest recognisable red-cell precursor, the pronormoblast, and in general a higher uptake was noted in the early cell-types than in the late cell-types. From changes with time of the proportion of the labelled cells and of the grain-counts over individual cells, information was obtained on the maturation time of normoblasts and on the dynamics of reticulocyte production. The actual process of ^{59}Fe uptake was found to be rather radioresistant—5000 rads in vitro or 220 rads T.B.R. did not affect the cellular uptake, though such doses seriously affected cell proliferation. Dr. Lajtha emphasised the need for investigations at the cellular level, especially in heterogeneous populations like the bone-marrow.

Surface-counting after Injection of Radioactive Iron

Dr. A. J. GRIMES, Dr. M. S. R. HUTT, and Dr. G. WETHERLEY-MEIN (London) had used the technique of surface-counting after the injection of a tracer dose of ^{59}Fe. When records of the changes in activity over the liver and marrow were recorded for three to seven days after injection, a qualitative assessment of erythropoietic activity was possible, and patients could be classified as normal, hypoplastic, or aplastic. Changes in splenic activity were more difficult to interpret, particularly in the matter of the demonstration of splenic hæmolysis. The pattern of splenic erythropoiesis was, however, characteristic and easily recognised.

The factors which influenced the observed activity over any organ were: radioactive decay, the dose of ^{59}Fe, the blood-volume, the activity of blood flowing through the organ and from adjacent organs, the size of the labelled iron pool, and the organ geometry. Correction for dose, decay, and blood-volume was possible, and a correction for blood-flow was described. Despite these corrections the number of variables made it impossible to derive truly quantitative data. Useful information could, however, be obtained from uncorrected curves, and examples were demonstrated of hypoplasia, maturation defect, extramedullary erythropoiesis, and chronic myeloid leukæmia.

Routine Urine-testing in the Ward

Dr. J. HARKNESS (Taunton) pointed out that the testing of urine by nurses in the ward side-room was usually the responsibility of the clinician-in-charge and not of the pathologist. Inspection of equipment and techniques by a laboratory trained-person might find scope for criticism under four main headings: (1) inadequate care of reagents; (2) use of non-standard apparatus; (3) spoiling of satisfactory techniques by introduction of unauthorised modifications; and (4) insufficient time allowed for the tests to be performed carefully and repeated as necessary. As a result of pilot trials, Dr. Harkness continued, a small compact tray was developed which held the apparatus for five tests, to be carried out in parallel, and reagents sufficient for about a hundred of each of the common tests.

Atypical Cushing's Syndrome

Dr. A. W. B. EDMUNDS, Mr. K. C. MCKROWN, and Dr. P. N. COLEMAN (Northallerton) described an atypical case of Cushing's syndrome due to adrenal hyperplasia in which there was a pigmentation resembling Addison's disease and a hypokalæmic alkalosis as severe as anything that has been reported in Conn's syndrome. All the abnormalities disappeared after adrenalectomy. Although no excess of aldosterone could be demonstrated in the urine, the electrolyte disturbance may have been due to overproduction of aldosterone. It was considered that the pigmentation was the result of pituitary activity—a possible attempt to compensate, by the stimulation of the secretion of cortisone, for the excessive adrenal production of mineralo-corticoid.

Reviews of Books

Textbook of British Surgery

Vol. II Editors: Sir HENRY SOUTTAR, C.B.E., D.M., F.R.C.S., consulting surgeon, The London Hospital; J. C. GOLIGHER, CH.M., F.R.C.S., professor of surgery, University of Leeds. London: Heinemann Medical Books. 1957. Pp. 693. 105*s*.

LIKE the first volume, this excellent book pursues an admirably clear objective: its business is to teach, and that requires lucidity without oversimplification, authority without dogma, and comprehensiveness without excessive bulk.

Three special cheers are raised for Mr. C. A. Keogh for his chapter on the ear and throat. Sparkling and fresh, yet mature in clinical wisdom, he makes an exciting and intensely personal art *sound* like an exciting and intensely personal art. An elegant, yet commanding, style also distinguishes the quasi-monograph on surgery of the heart and great vessels by Mr. N. R. Barrett and Mr. John Anderson. It is, of course, impossible to be dull on this subject; but flux might easily have been translated into confusion. Their chapter does more than portray the astounding youth and vigorous early manhood of cardiac surgery: it reflects the surgeon's impact on orthodox cardiology and circulatory physiology.

Most of the illustrations are excellent; but some of the cervical lumps have to be believed to be seen. In a text of this kind there is much to be said for adding a list of key references to every chapter, and the view that references should be kept to a minimum can at least be defended (Mr. Richard Handley's list on diseases of the breast is a model of judicious selection); but it is surely an error to offer the reader what, at first glance, he might easily mistake for a bibliography of the contributor. And why "British" surgery? However carefully the surgical traveller may pick his way—and, fortunately, none of the contributors make the slightest effort—he is bound to tread on such distinguished foreign toes as that of Billroth, Halsted, and Blalock.

But these are small blemishes. Impatience for the third and fourth volumes is unabated.

Cholesterin: Ernährung: Gesundheit

Prof. Dr. WILHELM HALDEN, University of Graz; Doz. Dr. LUDWIG PROKOP, University of Vienna. Munich, Berlin, and Vienna: Urban & Schwarzenberg. 1957. Pp. 80.

THIS concise treatise is concerned with one aspect of cholesterol metabolism—namely, the importance of nutritional factors and the rôle of cholesterol in the pathogenesis of atheroma. Dietary cholesterol is responsible for only a small fraction of the body's cholesterol; most of it is formed by endogenous synthesis from simple compounds. A diet containing unsaturated fatty acids, choline-containing phospholipids, and protein tends to reduce hypercholesterolæmia, while saturated long-chain fatty acids and their esters raise the cholesterol level in the blood; but cholesterol intake is probably only a relatively minor factor in the complex development of atheroma. The book gives an easily understandable account of these findings and their possible significance.

Introduction to Clinical Endocrinology

A. STUART MASON, M.A., M.D. Cantab., M.R.C.P., senior lecturer, medical unit, The London Hospital; consultant physician, department of endocrinology, New End Hospital, Hampstead. Oxford: Blackwell Scientific Publications. 1957. Pp. 192. 22*s*. 6*d*.

A COMPREHENSIVE account of clinical endocrinology in less than 200 pages is a feat. The book is intended simply as an introduction to the larger textbooks and it enables the general reader to gain a good grasp of the subject in a comparatively short time; but it also contains ample information for the candidate for higher examinations in medicine.

Each chapter begins with a short account of the basic anatomy and physiology of the endocrine gland under consideration and of the chemical structure and physiological actions of its hormones. There follows a description of the clinical features and treatment in terms of applied physiology. A short appendix is added describing the diagnostic tests in common use and referring to the more specialised and technically difficult estimations. References are avoided throughout, though a short reading list is added at the end of the book. Though discussion is kept to the minimum, dogmatism is avoided. Photographs are deliberately excluded, the emphasis being rightly placed on applied physiology and early diagnosis rather than on purely visual recognition of the fully developed disease with its often grotesque manifestations.

The book is easy to read, and some of the clinical descriptions show imagination and insight into the patient's problems.

Lectures on the Scientific Basis of Medicine

Vol. v, 1955–56. London: The Athlone Press. 1957. Pp. 468. 45*s*.

THE fifth volume in this series of lectures arranged by the British Postgraduate Medical Federation maintains the excellence of its predecessors. As usual the first lecture is couched in general terms: Sir Wiltrid Le Gros Clark's beautifully written essay emphasises the value of speculations in research as a basis for experiment; they may promote the advance of research, he remarks, "even to the point where they themselves become extinguished."

Some lectures, such as Dr. M. D. Milne's account of the renal control of acid-base balance, are of direct clinical interest; but most are physiological in accent, though clinicians will find them interesting and surprisingly readable. Prof. N. H. Martin begins his fascinating account of primary protein deficiencies with the arresting sentence: "All disease processes result from interference, whether extrinsic or intrinsic, with the normal metabolism or the final configuration of one or more of the proteins of the body"; and the biochemical emphasis of many of the lectures well illustrates the current direction of medical thought.

Other notable contributions are Dr. A. C. Dornhorst's chapter on the evidence for a mucosal valve at the cardia, Dr. Audrey Smith's work on experimental hypothermia in animals, Dr. J. M. Barnes's account of certain mechanisms of toxicity, and Dr. J. F. Loutit's discussion of recovery from effects of radiation—though such is the rate of progress that even in the brief period since the lectures were given important new advances affecting some of these subjects have been announced. Particularly interesting in a volume which deals with some fundamentals in biology is the lecture in which Prof. H. A. Krebs points out that many metabolic processes are controlled only in part by nervous or hormonal influences, and that feedback mechanisms are as important in higher animals as in unicellular organisms.

On Being Human

ASHLEY MONTAGU. London: Abelard-Schuman. 1957. Pp. 125. 9*s*.

THOUGH he does not actually quote Alexander Pope, Dr. Montagu's theme might fairly be defined as "The proper study of mankind is Man." An eminent anthropologist and psychiatrist, he feels that in the past too much emphasis has been placed, in biological and economic studies, on those human instincts which make for aggressiveness and individual success. He points out that man—indeed, animal life in all its forms—possesses, as well, powerful instincts for coöperation and improvement of the species as a whole. Only by educating our children in the problems of human relationships, and by developing in them an awareness of these instincts, says Dr. Montagu, will the tensions of the modern world be resolved. Doctors will find his argument particularly interesting, for it derives in part from differences observed between babies reared as members of united families and those brought up in the impersonal environment of hospitals.

Some Milestones in the History of Hematology (London and New York: Grune & Stratton. 1957. Pp. 87. 35*s*.).—This interesting little book by Dr. Camille Dreyfus, chef de laboratoire of the Hôpital St. Antoine in Paris, contains five essays on the history of hæmatology. The first and longest deals with the development of the microscopic study of the blood, another is a biography of Georges Hayem, and the others are on chronic hæmolytic jaundice, leukæmia, and "plethora vera." The emphasis is on French investigators, though others are not neglected. The information gathered in this volume is little known or scattered and it is valuable to have it thus drawn together.

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THE LANCET
LONDON: SATURDAY, OCT. 12, 1957

Mortal Memory

"IT seems as one becomes older that the past has another pattern and ceases to be a mere sequence." Thus wrote T. S. ELIOT,[1] but in the poetic concept of the multidimensional nature of the past he overlooked the essential difference between its objective actuality and our subjective recall thereof. Indeed apart from the volitional mutation of remembrance of events long past, it is the inexact revival of past life which so often enhances the attraction (both to writer and to reader) of the autobiography. In addition to this softening of the hard reality, there are other aspects of the functioning of our memories, at times merely inconvenient, at other times maddeningly challenging, which may inspire all of us at one time or another to reflect on the mechanisms which underlie the processes of memory and remembering. The view from clinical neurology into the fields of spiritual and mental function has proved most attractive to many notable workers; and it is not surprising that Dr. RITCHIE RUSSELL elected to discuss the physiology of memory in his presidential address last week to the section of neurology of the Royal Society of Medicine. In presenting his ideas Dr. RITCHIE RUSSELL first sketched out certain basic physiological factors which he regards as important in the memory mechanisms, and then filled in his conceptual design with detail gleaned from personal and reported clinical observations on events in learning and forgetting. It is abundantly clear that comprehension of the process of forgetting is vital to understanding of the initial process of memory.

The two important basic elements in Dr. RITCHIE RUSSELL's thesis were the tendency for nerve-cells to repeat patterns of activity, with a resultant development of "habit bonds" particularly in relation to simple motor performances such as handwriting, and the capacity of all forms of animal life to encourage an advantageous response or discourage a disadvantageous response. This latter quality might be regarded as a personal reaction governing the formation of performance habits and may well form the link between psychological and physiological concepts of memory. The "repeat capacity" of a reaction may be the most primitive example of a memory process, and Dr. RITCHIE RUSSELL accepted J. Z. YOUNG's notion[2] that the cells of the central nervous system are in constant activity discharging spontaneously day and night. A trained and attentive system directs new afferent stimulation into well-established channels; so there is ultimately a remarkable degree of constancy of response. It is in this way that a "habit" is formed in the central nervous system at all levels. This development of constancy of response must be regarded as a learning process, and a task once learnt in this fashion is not forgotten—not because it is stored away in some mysterious "memory centre" but because the established neuronal activity maintains and even strengthens the pattern of the response. The central nervous system maintains what has been learnt by exercising the neuronal pattern established when the skill was first acquired; unbeknown to the individual the nervous system practises its learned skills throughout life. So far so good, but at this point in his argument Dr. RITCHIE RUSSELL insinuated the notion (though not without a backward apologetic glance for the stratagem) "that the memory of a physical task and of a so-called mental problem are basically dependent upon the same physiological mechanisms. There may well be circumstances in which the unconscious activity of the C.N.S. provides a more effective form of training than does actual practice." And again: "It is intriguing to speculate upon the part which this mechanism may play in assisting the mental clarification which often results from putting aside a complicated problem from one's conscious thought for a few days or hours." But if identification of the process of acquiring a skill with the process of memory is unlikely to appeal to everyone, the claim that memory of a skill and the capacity to repeat it are to some extent one and the same is even less attractive. When, therefore, Dr. RITCHIE RUSSELL combined these two ideas the resultant postulate suffered from the cumulative defects of two very questionable hypotheses. Can it really be true that the ability to ride a one-wheel bicycle and to balance unbelievable numbers of cups on one's head is acquired by a process identical with that which recalls snatches of *Paradise Lost* after years of neglect, or the unimportant detail of a childhood holiday in the late stages of ageing? Is it really correct to say that the memory of a skill and the capacity to repeat it are one and the same? Does the Test bowler forget the method of his triumphs when he can no longer pitch and turn the unplayable ball? Acceptance or rejection of this part of the argument in no way affects the interest and validity of the rest of the reasoning. Establishment of patterns of behaviour almost certainly depends on functional changes at synapses; for, although Dr. RITCHIE RUSSELL perhaps dismissed rather lightly the possibility of intracellular nuclear change as a means of one type of memory storage, we must accept his contention that memory is a very active process which becomes lost only when the neurones concerned cease to discharge along the pathways once facilitated by synaptic interplay.

The clinical observations which followed this basic exposition were particularly stimulating. The curious implications of the phantom limb, the development of phantom pain, and the part played by the parietal lobes in appreciation and presumably memory of the body image were discussed briefly; and then followed some illuminating comments on the rôle of the hippocampal formation in the memory mechanisms. Removal of the hippocampus and of both temporal lobes produces a severe defect of immediate memory leaving remote memory fairly intact; similar memory defect is a feature of Korsakoff's psychosis in which the mamillary bodies are affected. On the other hand the *déjà-vu* phenomenon of the temporal-lobe lesion suggests that this area of the brain plays an important part in the remembrance of events and in the general process of recall. From this evidence it seems reasonable to suggest that the hippocampus plays its part both in the learning process and in that of recall.

1. Eliot, T. S. The Dry Salinger. London, 1941.
2. Young, J. Z. Patterns of Substance and Activity in the Nervous System. 1946.

Yet (Dr. RITCHIE RUSSELL continued) the hippocampus may have little part in the actual storage of memories, and it can act only as a boosting feedback or replaying mechanism. His own work with Dr. WHITTY [3] has shown that formed visual hallucinations may take place in parieto-occipital lesions as well as in those of the temporal cortex; and he suggested that the parietal area may contain the main pattern of facilitated circuits which constitutes the permanent memory, and that the temporal lobe boosts these mechanisms through the hippocampus. An interesting extension of this idea was that the hippocampal system has to play back to the parieto-occipital region for a period of seconds before even a vivid visual experience can be established as a faint memory.

And what of hallucinations? These Dr. RITCHIE RUSSELL regards as examples of a disordered memory mechanism which may even result in artistic products. Indeed some forms of modern art seem to depend on a cultivated capacity for hallucinations—confused glimpses of fragmentary repetitions of previous thought or reaction. This opinion may not be entirely fair to modern art, whose capacity for creative visualisation is thereby rejected. Moreover, the assumption that all hallucinations are memory revivals does not seem to be justifiable, for it is quite reasonable to suggest that certain visual hallucinations represent original thinking activity. A similar point may be made in relation to certain works in modern music. We might indeed be tempted to believe that the more cacophonous compositions of the atonal school also represent confused snatches of fragmentary repetition of previous auditory thought or reaction; but it is more likely that the fault of comprehension lies in ourselves, and that these works represent genuine original auditory creation.

The information to be gained about memory processes from the study of patients recovering from head injuries is also of special interest. The commonly observed shrinkage in the retrograde amnesia is analogous (said Dr. RITCHIE RUSSELL) to the process of recent memory loss in Korsakoff's psychosis and, of course, to the similar feature of the arterial and even the presenile dementias in their early stages. Remote memories are often resistant to the effect of disease. It will be seen that this accords very well with the idea that memories depend on synaptic facilitations which may gain strength automatically and unconsciously, although it must be added that attention and uniqueness of the experience are important factors in the ultimate ease of recall.

Thus Dr. RITCHIE RUSSELL drew, as he himself said, "a somewhat terrifying picture of thousands of millions of nerve-cells all discharging throughout life at high speed to maintain the synaptic patterns on which our memories depend." He went on to suggest that these reverberating circuits are normally kept in the unconscious by concurrent inhibitory systems. From time to time some unspecified alerting process brings into consciousness one or other of these memory circuits, but further than this one could not go in the present stage of reasonable theorising. In short the problems unsolved far exceed those solved. But even if these current hypotheses should later prove to be incorrect their very proposition is itself a stimulus and in that sense a progenitor of the truth.

3. Russell, W. R., Whitty, C. W. M. *J. Neurol. Psychiat.* 1955, 18, 79.

Secretion of Aldosterone

IN the short time since aldosterone was isolated [1] and chemically identified,[2] its pharmacological effects and probable function in health and disease have been much discussed.[2–5] As the adrenal steroid most potent in promoting the renal retention of sodium, it is believed to play a critical rôle in the regulation of electrolyte metabolism and to be associated with the formation of œdema in various clinical conditions.[4 6] Weight for weight, aldosterone is some twenty-five times more active than deoxycortone in promoting sodium retention; and, though there are some qualitative differences,[7 8] the pharmacological effects of the two steroids are closely similar. Accurate physicochemical methods now permit the separation of aldosterone from lipid extracts of biological fluids,[9–11] and, though the amount in peripheral human blood is extremely small (estimated as 0·08 μg. per 100 ml.[12]), it can be demonstrated and measured in the adrenal venous blood of the dog [13] and the rat.[14] Aldosterone labelled with tritium in the 16-position disappears from the blood after intravenous injection at about three times the rate of injected hydrocortisone [15] and it is likely that the hormone is rapidly inactivated by the liver.[16] Using the radioactive derivative SIMPSON and TAIT have estimated that the normal human glands produce about 200 μg. daily, of which little more than 5% appears as a conjugate in the urine.[15] Hitherto, in man, the rate of aldosterone secretion has had to be inferred from measurement of the small fraction excreted in the urine; material containing tritium promises both to simplify the urinary estimation itself and to permit measurement of the adrenal secretion-rate in different clinical and physiological states. Since DEMING and LUETSCHER [17] first demonstrated the presence of a sodium-retaining material in lipid extracts of nephrotic urine, urinary aldosterone has commonly been measured by observing the effects of crude or partly purified extracts on the renal output of sodium by adrenalectomised animals. This method of assay has the disadvantage that contaminants in the urinary extract may promote the renal excretion of sodium, and what is measured as "sodium-retaining activity" may sometimes be only remotely related to the actual output of aldosterone. In congenital adrenal hyperplasia with renal wastage of salt, the urinary output of aldosterone may be normal or increased, suggesting that the adrenals may be producing some material which either antagonises the action of aldosterone or itself influences the renal

1. Simpson, S. A., Tait, J. F. *Nature, Lond.* 1952, 169, 795.
2. Simpson, S. A., Tait, J. F., Wettstein, A., Neher, R., Von Euw, J., Schindler, O., Reichstein, T. *Helv. chim. acta*, 1954, 37, 1200.
3. Gaunt, R., Renzi, A., Chart, J. J. *J. clin. Endocrin.* 1955, 15, 621.
4. Luetscher, J. A. *Advanc. intern. Med*, 1956, 8, 155.
5. Symposium on Aldosterone. Clinique Thérapeutique of the University of Geneva; June, 1957. London. (In the press.)
6. Laragh, J. H. *Amer. J. Med.* 1956, 21, 423.
7. Gross, F., Lichtlen, P. (Footnote 5.)
8. Desaulles, F. (Footnote 5.)
9. Ayres, P. J., Garrod, O., Simpson, S. A., Tait, J. F. *Biochem. J.* 1957, 65, 639.
10. Neher, R., Wettstein, A. *J. clin. Invest.* 1956, 35, 800.
11. Moolenaar, A. *Acta endocr., Copenhagen*, 1957, 25, 161.
12. Simpson, S. A., Tait, J. F. Ciba Foundation Colloquia on Endocrinology. London, 1955; vol. 8, p. 204.
13. Farrell, G. L., Royce, P. C., Rauschkolb, E. W., Hirschmann, H. *Proc. Soc. exp. Biol., N.Y.* 1954, 87, 141.
14. Singer, B., Stack-Dunne, M. P. *J. Endocrin.* 1955, 12, 130.
15. Simpson, S. A., Tait, J. F. (Footnote 5.)
16. Chart, J. J., Gordon, E. S., Helmer, P., Lesher, M. *J. clin. Invest.* 1956, 35, 254.
17. Deming, Q. B., Luetscher, J. A. *Proc. Soc. exp. Biol., N.Y.* 1950, 73, 171.

handling of sodium.[18] WETTSTEIN[19] mentions the isolation of an adrenal steroid with such a sodium-losing effect. Determination of urinary aldosterone by bioassay without prior physicochemical purification thus measures "apparent aldosterone"; and some physiological effects now ascribed to varied secretion of aldosterone may need re-examination as other adrenal steroids are found to influence mineral metabolism.

Despite these difficulties, there is much indirect and some direct evidence pointing to the mechanisms regulating the adrenal output of aldosterone. Clinical experience of patients with hypopituitarism has long suggested that the adrenal regulation of sodium metabolism is independent of pituitary control,[20] though in some chronic cases of adrenocortical atrophy sodium conservation may be defective.[21 22] Patients maintained on cortisone after hypophysectomy can preserve sodium balance with a daily sodium intake of less than 10 m.eq.[23]; aldosterone is detectable in the urine in the absence of the pituitary.[21] Stimulation with corticotrophin, which greatly increases the urinary output of 17-hydroxycorticoids in healthy people, has only a small and transient effect on aldosterone output; and administration of cortisone, which suppresses the adrenal output of hydrocortisone, has negligible influence on the urinary output of aldosterone.[24] In dogs treated with hydrocortisone the adrenal venous content of hydrocortisone and corticosterone is greatly reduced, while the output of aldosterone is essentially unchanged.[25] Hypophysectomy in the dog [26] or the rat [14] reduces the secretion of aldosterone into the adrenal vein but reduces much further the output of hydrocortisone and corticosterone, so the ratio of aldosterone to glucocorticoids is much increased. This physiological evidence for a dual control of adrenocortical secretion is supported by the older histological observations of GREEP and DEANE,[27 28] which suggested that the zona fasciculata was subject to anterior pituitary control, whereas the zona glomerulosa was indifferent to this influence but responded to imposed changes of sodium or potassium metabolism. It has now been established, by in-vitro metabolic studies of bovine,[29 30] rat,[30] and human [15] adrenals, that aldosterone is produced exclusively in the zona glomerulosa, hydrocortisone mainly in the zona fasciculata, and corticosterone in both. In an extension of this technique, GIROUD et al.[30] have shown that the in-vitro production of aldosterone is uninfluenced by anterior pituitary extracts which increase the formation of hydrocortisone and corticosterone. Some (but not all) crude extracts of posterior pituitary increased aldosterone production by the zona glomerulosa, though purified vasopressin and oxytocin were without effect. This suggests that some other material, either produced in the posterior pituitary or present as a contaminant derived from adjacent cerebral tissue, may influence the adrenal production of aldosterone. Observations by RAUSCHKOLB and FARRELL[31 32] in the dog suggest that release of aldosterone into the adrenal vein depends on the integrity of diencephalic structures; and some humoral adrenotrophic substance originating in this region may be responsible for the control of aldosterone secretion.

Although the precise mechanisms that regulate the secretion of aldosterone have not been identified, there is much evidence relating its output to the bodily content of sodium. Urinary excretion of aldosterone is increased by restriction of dietary sodium and decreased by administration of sodium salts[33–35]; and there is a general inverse relationship between the urinary output of sodium and of aldosterone.[34] This influence of changing sodium economy on the output of aldosterone seems to be mediated, not through change either in the serum-sodium or in the osmolarity of body-fluids, but through its effect on the volume of the extracellular fluid (E.C.F.).[36–38] The volume of the E.C.F. in man can be changed experimentally in several ways. It can be expanded hypotonically by forced retention of water with vasopressin,[39] isotonically by infusion of physiological saline solution, or hypertonically by infusion of hypertonic solutions of sodium chloride; each method results in reduced urinary aldosterone.[36] Conversely, reduction in E.C.F. volume, whether due primarily to loss of sodium or simply to loss of water, seems to stimulate the secretion of aldosterone.[36] In miscellaneous clinical conditions the E.C.F. is greatly expanded and the secretion of aldosterone increased. It is unlikely, therefore, that the adrenals respond to change in the overall volume of the E.C.F., and attention has been directed to the circulating blood-volume as the fraction of the E.C.F. most likely to be critical in the control of aldosterone secretion. Hæmorrhage [40] or experimental venesection[37 41] increases the output of aldosterone; and BARTTER[37 38] has exploited this feature in an ingenious series of experiments which make clear the importance of the blood-volume. How and where a critical reduction of blood-volume makes its impact felt, and whether the adrenal is affected directly or through the release of some trophic factor, as suggested by FARRELL,[31] is quite unknown. Many attempts have been made to locate the so-called "volume receptor" in the head or in the thorax, but none has been successful.

There is evidence, too, that potassium may be concerned in the regulation of aldosterone secretion. In man administration of potassium salts increases

18. Prader, A., Spahr, A., Neher, R. *Schweiz. med. Wschr.* 1955, **85**, 1085.
19. Wettstein, A. Verhandlungen der schweizerischen naturforschenden Gesellschaft. 1956, p. 22.
20. Sheehan, H. L., Summers, V. K. *Quart. J. Med.* 1949, **18**, 319.
21. Luetscher, J. A. *Recent Progr. Hormone Res.* 1956, **12**.
22. Caughey, J. E., Garrod, O. *Brit. med. J.* 1954, **ii**, 554.
23. Maclean, J. P., Li, M. C., Lipsett, M. B., Ray, B., Pearson, O. H. *J. clin. Invest.* 1955, **34**, 951.
24. Liddle, G. W., Duncan, L. E., Bartter, F. C. *Amer. J. Med.* 1956, **21**, 380.
25. Farrell, G. L., Banks, R. C., Koletsky, S. *Endocrinology*, 1956, **58**, 104.
26. Rauschkolb, E. W., Farrell, G. L., Koletsky, S. *Amer. J. Physiol.* 1956, **194**, 55.
27. Deane, H. W., Greep, R. D. *Amer. J. Anat.* 1946, **79**, 117.
28. Greep, R. D., Deane, H. W. *Ann. N.Y. Acad. Sci.* 1949, **50**, 546.
29. Ayres, P. J., Gould, R. P., Simpson, S. A., Tait, J. F. *Biochem. J.* 1956, **63**, 19P.
30. Giroud, C. J. P., Piletta, P., Stachenko, J. (Footnote 5.)
31. Rauschkolb, E. W., Farrell, G. L. *Endocrinology*, 1956, **59**, 526.
32. Rauschkolb, E. W., Farrell, G. L. *J. clin. Endocrin.* 1956, **16**, 915.
33. Luetscher, J. A., Axelrad, B. J. *Proc. Soc. exp. Biol., N.Y.* 1954, **87**, 650.
34. Luetscher, J. A., Curtis, R. H. *Ann. intern. Med.* 1955, **43**, 658.
35. Duncan, L. E., Liddle, G. W., Bartter, F. C. *J. clin. Invest.* 1956, **35**, 1299.
36. Bartter, F. C., Liddle, G. W., Duncan, L. E., Barber, J. K., Delea, C. *Ibid*, p. 1306.
37. Bartter, F. C. *Metabolism*, 1956, **5**, 369.
38. Bartter, F. C. (Footnote 5).
39. Wrong, O. *Clin. Sci.* 1956, **15**, 401.
40. Farrell, G. L., Rosnagle, R. S., Rauschkolb, E. W. *Fed. Proc.* 1956, **15**, 60.
41. Wolff, H. P., Koczorek, Kh.R., Buchborn, E. *Schweiz. med. Wschr.* 1957, **87**, 163.

urinary aldosterone,[34 42] and restriction of potassium intake to 9 m.eq. per day decreases aldosterone excretion.[43] In the rat potassium deficiency has been found to reduce the adrenal venous content of aldosterone by 90%, but leaves the production of corticosterone apparently unchanged.[14] Perfusion of bovine adrenal glands with fluid of increased potassium and lowered sodium content increases the secretion of aldosterone into the perfusate.[44] It is by no means clear how disturbances of potassium metabolism bring about changes in the adrenal production of aldosterone, but LARAGH and STOERK[45] believe that the effect is mediated through change in the serum content of potassium. This conclusion, based on measurements of urinary aldosterone in the dog, has not been generally accepted. In the dog it has been estimated that urinary aldosterone represents no more than 1% of the output of the adrenal glands[46]; and ROSNAGLE and FARRELL[47] have suggested that potassium may influence the renal handling of aldosterone rather than its rate of secretion by the adrenal. Whereas deprivation of sodium doubled the output of aldosterone into the adrenal vein of the dog, administration of potassium salts had no apparent effect.[47] Notwithstanding this direct evidence to the contrary, a mass of accumulated data indicates that the adrenal glands respond to changes in potassium economy; and, in subjects moderately deficient of potassium, the response of urinary aldosterone to the deprivation of sodium is delayed and quantitatively subnormal.[43] It may be that changes of sodium balance influence the central release of an adrenotrophic influence, while potassium produces its effects more directly within the adrenal glands by changing the cellular milieu wherein the hormone is synthesised.

42. Falbriard, A., Muller, A. F., Neher, R., Mach, R. S. *Ibid*, 1955, **85**, 1218.
43. Johnson, B. B., Lieberman, A. H., Mulrow, P. J. *J. clin. Invest.* 1957, **36**, 757.
44. Rosenfield, G., Rosemberg, E., Ungar, F., Dorfman, R. I. *Endocrinology*, 1956, **58**, 255.
45. Laragh, J. H., Stoerk, H. C. *J. clin. Invest.* 1957, **36**, 383.
46. Davis, J. O., Pechet, M. M., Ball, W. C., Goodkind, M. J. *Ibid*, p. 689.
47. Rosnagle, R. S., Farrell, G. L. *Amer. J. Physiol.* 1956, **187**, 7.

Annotations

NEXT WEEK'S LANCET

NEXT week's issue of *The Lancet* will look different because our Contents Page will be transferred to the front cover; and it will reach subscribers in a different wrapper. The reason for making these changes at this particular moment is that from next week the journal is to be produced by a different process. Messrs. Hazell, Watson, & Viney are closing their establishment in Long Acre, where the journal has been printed for the last 37 years; and, though they and their associates outside London will continue to print *The Lancet*, they are going to use new methods. The period of transition may well be difficult, and we hope that if readers notice deficiencies they will postpone judgment for at least a few weeks.

BACTERIOSTATIC OR BACTERICIDAL?

MUCH of the *mystique* which surrounded the antibiotics a few years ago has now been dispelled, but they still preserve their enchantment for those microbiologists who are concerned to know the mode of action of these latter-day "magic bullets." Why do certain chemical compounds kill micro-organisms but not harm animal tissues? Why have some drugs a wide and others a very narrow spectrum of antimicrobial activity? Why do some antibiotics cause rapid death in susceptible species (bactericidal action) while others arrest growth without actually killing (bacteriostatic action)? Progress is continually being made in establishing the nature of the processes, present in the parasite but not in the host, which might be sites for specific attack.

Some surface-active compounds, such as tyrocidin and polymyxin, have an all-or-none effect in damaging the cell membrane[1] and must, therefore, be bactericidal if they act at all; but in other cases the effect depends on the conditions. Thus penicillin has little or no activity on susceptible bacteria unless they grow in its presence for about a generation. Under these conditions the cells lyse, and it has lately been found that this is probably due to interference with cell-wall synthesis.[2] In penicillin-treated staphylococci there accumulates a substance containing carbohydrate and amino-acids which is believed to be a cell-wall precursor. Apparently, unbalanced growth results in continued cytoplasmic increase without parallel cell-wall formation, and lysis ensues. Bacterial-cell walls[3] are being found to contain substances (such as the amino acid diaminopimelic acid, certain D-amino acids, and hexosamine derivatives) which have not been encountered elsewhere in living organisms, and these may be a possible target for chemotherapy.

Sulphonamides are known to interfere with several biosynthetic reactions in bacteria, but the effects can be largely overcome by adding the products of these reactions—certain amino-acids and purine and pyrimidine bases. If, in the presence of sulphanilamide, all these substances are added except thymine (a constituent of the genetic material, deoxyribonucleic acid), then synthesis of protein and ribonucleic acid can continue for about a generation. But since no nuclear increase is possible, the unbalanced growth leads to rapid death of the cells[4]—i.e., sulphanilamide is bactericidal. When both thymine and one of the other essential substances (such as an amino-acid) are omitted, sulphanilamide arrests both nuclear and cytoplasmic growth; this causes bacteriostasis but not death.

Chloramphenicol has a highly specific action in inhibiting protein synthesis while allowing formation of nucleic acid to continue.[5] Again, this results in unbalanced growth; but a situation can arise in which presence of a drug actually prevents death by interfering with destructive reactions which would be lethal in its absence. For instance, *Escherichia coli* stored in broth at a density of about 5×10^9 cells per ml. showed a much higher maintenance of total and viable count at both 5°C and 22°C when chloramphenicol was present (10 or 100 μg. per ml.) than when it was absent.[6] The tetracyclines, such as chloramphenicol, are often thought to be bacteriostatic, but under appropriate conditions they have bactericidal activity.[7]

It is questionable whether it would be worth while, as has been suggested,[7] to reclassify drugs as bacteriostatic (e.g., sulphonamides), slowly bactericidal (e.g., tetracyclines), and rapidly bactericidal (e.g., penicillin and streptomycin). The existing terminology suffices so long as it is remembered that circumstances alter cases. We need greater insight into how drugs act, rather than a more elaborate classification. One of the significant developments in our understanding is the increasing evidence of the importance of unbalanced growth as an active process which can lead to death.

1. Newton, B. A. *Bact. Rev.* 1956, **20**, 14.
2. Park, J. T., Strominger, J. L. *Science*, 1957, **125**, 99.
3. Work, E. *Nature, Lond.* 1957, **179**, 841.
4. Cohen, S. S., Barner, H. D. *Pediatrics*, 1955, **16**, 704; *J. Bact.* 1956, **71**, 588.
5. Gale, E. F., Folkes, J. P. *Biochem. J.* 1953, **53**, 493.
6. Morrison, R. B., El Bagoury, S., Fletcher, S. *Nature, Lond.* 1956, **178**, 1467.
7. Hamburger, M., Carleton, J. *J. Lab. clin. Med.* 1957, **49**, 276.

CYANOTIC ATTACKS

ATTACKS of apnœa and cyanosis are common emergencies in the neonatal period. They are most often seen in small babies whose condition is already giving rise to anxiety, but they may suddenly appear in babies who are otherwise well. Professor Illingworth has drawn attention to the paucity of published information about cyanotic attacks, and has contributed some valuable clinical facts about them.[1] For the purposes of his investigation he defined cyanotic attacks as "sudden attacks of cyanosis, lasting from a few moments up to half an hour in children whose colour was previously normal, and whose colour returns to normal in atmospheric air after the attack." He excluded infants whose early neonatal course was marked by continuous cyanosis, and those who died in cyanosis, remaining blue until death. On this basis he found that 170 babies out of 7820 admitted to a maternity hospital had cyanotic attacks.

The incidence was greatest in premature infants and was related to birth-weight, the smallest infants having the greatest number of attacks. Complications of late pregnancy (maternal toxæmia, hypertension, and antepartum hæmorrhage) and asphyxia at birth apparently predisposed to cyanotic attacks in the newborn. Most attacks began in the first week of life, but 1 infant had a first attack on the 27th day.

The mortality of infants at all birth-weights was greater in those having cyanotic attacks. Whether this is because such attacks are commoner in babies that are already gravely ill, or because of the dangerous nature of the attacks themselves, is not clear. Certainly no specific causes of death were found at necropsy to account for the excess mortality. In both groups of infants—those with and those without cyanotic attacks—the commonest causes of death were severe atelectasis and gross intracranial hæmorrhage.

In most cases cyanotic attacks accompany serious pathological states, especially those associated with respiratory distress or cerebral depression; but they sometimes arise in the absence of apparent underlying disease. Illingworth found in 29 cases no cause except presumed respiratory obstruction due to mucus, liquor, meconium, vomitus, or milk; in others the attacks were deemed to be caused by protracted apnœa. In this group of infants the attacks are presumably related to their physiological immaturity, and the ætiology has not yet been explained. Many observers have drawn attention to the irregularities in the breathing-patterns of young infants. In the spells of periodic breathing often seen in healthy infants, apnœa may be prolonged. Rossier[2] pointed out that in premature infants cyanotic attacks are almost invariably preceded by apnœa. Cross and his colleagues[3,4] analysed the effects of differences in the composition of inspired air on periodic respiration, and showed that high oxygen-content and increase in carbon dioxide tend to reduce periodic breathing, while hypoxia increases this type of respiration. The changes in blood-gases related to apnœic spells have been investigated by Blystad,[5] who found a tendency to respiratory acidosis. Fundamental knowledge about the control of respiration in the newborn does not suffice to explain these findings in other than general terms. Whether the immaturity is central or peripheral, chemical or nervous, remains in doubt.

The immediate treatment of a cyanotic attack is aimed at restoring respiration and re-oxygenation of the infant. Gentle clearing of the air-passages is always important, and often stimulates the baby to make respiratory efforts. Oxygen should be given by face-mask; sometimes intragastric oxygen is valuable. Analeptic drugs may have a place, but overdosage can precipitate convulsions. After resuscitation the baby must be carefully examined, and any lesions found should be treated. Because cyanotic attacks tend to recur, the baby should be placed in a nursery under continuous skilled observation. The mortality in the cases reported by Illingworth was 48%—a figure that allows no complacency.

1. Illingworth, R. S. *Arch. Dis. Childh.* 1957, **32**, 328.
2. Rossier, A. Anoxia of the New-born Infant. Oxford, 1953; p. 53.
3. Cross, K. W., Oppé, T. E. *J. Physiol.* 1952, **117**, 38.
4. Cross, K. W., Hooper, J. H. D., Oppé, T. E. *Ibid.* 1953, **122**, 264.
5. Blystad, W. *Acta pædiat., Stockh.* 1956, **45**, 211.

POST-PHLEBITIC SYNDROME

THROMBOSIS in the deep veins of the leg is followed by the development of an extensive collateral venous circulation; but, though the sum of the cross-sections of these newly developed vessels may be greater than that of the thrombosed femoral or popliteal veins, the valves in the collateral pathways remain small and incompetent. If man were a horizontal animal this valvular insufficiency would be of no importance. In the orthograde position, however, the evacuation of blood from the veins of the leg depends on the calf muscles pumping against an efficiently valved deep system. Failure of the pumping mechanism results in a deep venous hypertension, which finally weakens the perforating or communicating veins of the leg and transmits the high pressure to the superficial network. The subcutaneous veins and capillaries are less well supported than the deeper vessels, and the rétrograde thrust of hypertensive waves leads to tortuosity or rupture of the capillaries and venules.[1]

In more than half the cases of the post-phlebitic syndrome a history is obtained of acute thrombophlebitis following childbirth or long-continued immobilisation. In the remainder the deep venous insufficiency is associated with "quiet" thrombosis or more rarely primary valvular insufficiency. The post-phlebitic leg exhibits œdema, pigmentation, varicosities, pain, dermatitis, induration, and ulceration, in this decreasing order of frequency. Bauer[2] found that ten years after acute deep thrombophlebitis 52% of the patients had leg ulceration, and this forms the greatest social and medical problem. The ulcer develops usually in the region of the perforating-vein "blow-outs," and is preceded by dermatitis often aggravated by over-treatment, sensitisation, or scratching. The underlying subcutaneous tissue is indurated and relatively avascular, except for a few incompetent veins. The ulcer itself has a necrotic base and tends to penetrate the deep fascia and produce a tibial periostitis; the bacterial flora is varied with staphylococci, streptococci, pseudomonas, proteus, and coliform organisms predominating.

Vein-grafting has not proved successful, and treatment is directed towards minimising the complications of deep phlebitis. The œdema should be controlled from its onset, and the patient, after being allowed up, must continue to wear a bandage support during the day. The leg should be raised during the day for periods of ten to fifteen minutes; and if the patient's occupation involves protracted standing it should, if possible, be changed. With a reasonable patient such measures will often prevent ulceration: it is in general the shiftless and unhygienic individual who gets an ulcer. If post-phlebitic ulceration has already developed, without doubt the most satisfactory method of treatment is by adequate and long-continued bandage support, with or without bland ointments and lotions. In the resistant case bed rest may be necessary, or more exceptionally the ulcer must be excised widely and replaced by a split-skin graft. De Takats[1] found that only 10% of 200 such grafts had broken down fifteen to twenty years later. The patient must, however, agree to continue with support even after grafting. The place of venous operations is less easy to determine. Incompetent superficial and perforating veins in the calf and ankle region should probably be ligated or stripped at the time of grafting; ligation of the femoral and popliteal veins has now passed out of favour. Lumbar sympathectomy has been advocated for

1. De Takats, G. *J. Amer. med. Ass.* 1957, **164**, 1861.
2. Bauer, G. *J. int. Chir.* 1948, **8**, 937.

the treatment of post-phlebitic ulceration; most patients are probably worsened by lumbar sympathectomy, which increases the arterial input without aiding venous return. De Takats [1] believes, however, that it helps in the cold clammy leg with associated arterial occlusion, and in the hyperhidrotic limb with recurrent weeping eczema.

With improvements in midwifery, social standards, and the early treatment of acute thrombophlebitis, the incidence of post-phlebitic ulceration will doubtless be reduced. Meanwhile its treatment remains a difficult and serious problem.

HEALTH CENTRES: NEW PATTERNS

SINCE the end of the war two-and-three-quarter million new permanent houses and flats have been completed in Great Britain. School building has kept closely in step with the new housing schemes. By contrast, provision for the general medical services has lagged far behind. This disappointing state derives from several causes, most of which have been brought out in a comprehensive review by the health committee [3] of the London County Council. Whereas schools are universally recognised as essential for local life, and have a high national building priority, combined health-centre buildings for the general medical services are still new and experimental; and unfortunately, despite the experiments already undertaken, they still occupy a very low place in the national building programme.

As the London local medical committee has pointed out, the right time to build a health centre is when the first of the houses or flats are going up. Incoming residents can then find their new general practitioner in the health centre if they wish to do so. With the one, unofficial, exception of Harlow New Town,[4] health centres have always been added to areas of new housing development long after the housing has been completed, when the patients have already found their way to existing doctors' surgeries and established their pattern of behaviour. The provision of a health centre in an area, whether new or old, where patterns of practice are already well established involves the doctors entering the centre in the risk of losing a substantial part of their practices. As the law stands, the Medical Practices Committee has no power to close to new entrants, even temporarily, an area which is not over-doctored, even though some of the doctors have decided to enter a health centre. There is, then, no guarantee that a doctor transferring his practice to a health centre will not find a "squatter" setting up in or near his old surgery and collecting those patients who will not make the extra effort to reach the rather less convenient health centre.

The Nuffield Provincial Hospitals Trust's Harlow experiment has shown that, if health centres are built in step with housing in areas of substantial new development, the risk of "squatting" is small, since the housing authority can, by its ownership of all premises, effectively prevent excessive competition. The health centre can then become the main place of practice for the general practitioners, instead of functioning only as a branch surgery. But in existing built-up areas health centres can succeed only if the law is amended to give the general practitioners entering them a fair chance.

The L.C.C. has reluctantly come to the conclusion that it is unrealistic to continue the long-term reservation of sites for major health centres. As an alternative, the London medical committee, the London Executive Council, and the London County Council, in agreement, are proposing that blocks of flats should be built on these sites, the ground-floor flats being so designed that they can be converted into health-centre suites in the future, if required. With this distant prospect Londoners will have to rest content for the moment.

3. Report to London County Council on Sept. 24, 1957.
4. Taylor, C., et al. *Lancet*, 1955, ii, 863. See *Ibid*, p. 859:

It is difficult to see why a small health centre should not be made a regular feature of every substantial flat re-development scheme from the outset. Doctors' surgeries of above average standard can already be seen on the ground floors of the Westminster City Council's Churchill Gardens development scheme, and in St. Pancras. Perhaps the L.C.C. may yet be able to persuade the many interested parties that the London medical committee's proposal to provide the health centres when the flats are built, and not in the remote future, is the only certain way to achieve success. If this can be done, London may yet set a pattern for health services in re-development areas where so far only Woodberry Down [5] and Darbishire House, Manchester,[6] have blazed a trail.

But whatever is done in the re-development areas, there will remain for many years to come the unsettled question of general practice in the older industrial areas of our large cities. Here the Nuffield Provincial Hospitals Trust is once more leading the way, this time in conjunction with the Department of Health for Scotland and the other health authorities in Edinburgh. Work is soon to begin on a new general-practitioner centre to be housed in the old Livingstone Dispensary in Candlemaker Row, just off the Grassmarket, next door to the Edinburgh University general-practitioner unit run by Dr. Richard Scott. Announcing this project, Mr. John Anderson, secretary of the Department of Health for Scotland, in a speech to the Scottish Association of Executive Councils on Sept. 27, said that conversion of the premises would cost about £25,000, and the annual upkeep, including salaries of staff, about £10,000. The Nuffield Trust are contributing £17,000 towards the capital cost and £13,000 towards the running costs in the first three years. The new centre will have five consulting-room suites, a laboratory, and X-ray and electrocardiographic services, which the general practitioners will be able to use directly. The centre will have a nursing staff and a social worker, in addition to clerical and technical assistance, and a senior physician will be available to act as medical adviser.

Of the three hundred family doctors in N.H.S. practice in Edinburgh, about a hundred have expressed interest in the scheme, and it is thought that the centre should meet their needs. They will continue to work from their own surgeries but will be able to see their own patients at the centre, by appointment, for special investigation or follow-up. It is hoped that the new centre may not only encourage general practitioners to investigate their patients more fully than has been possible in the past but also relieve the strain on hospital outpatient departments.

The Edinburgh centre will be something more than an extension of what has already been tried in the Nuffield diagnostic centre at Corby.[7] The availability of a senior consultant to help the general practitioners is a new departure, and the diagnostic facilities at Edinburgh will be more extensive than those at Corby. Moreover, Corby is essentially an area of new development and the Corby centre also functions as a hospital outpatient department. If the experiment succeeds a practical alternative to the conventional health centre in existing industrial areas may emerge. The Edinburgh centre is not, however, a substitute either for group-practice or for the conventional health centre in areas of new development; but even in these areas time may show that a general-practitioner centre on Edinburgh lines, perhaps associated with the local hospital, offers advantages.

5. See *Ibid*, 1952, ii, 772.
6. *Ibid*, 1954, i, 1235.
7. *Ibid*, 1954, i, 871.

Sir JOHN PARSONS, F.R.C.S., consulting ophthalmic surgeon to University College Hospital and consulting surgeon to the Royal London Ophthalmic Hospital, died on Oct. 7 at the age of 89.

Public Health

THE CHARACTERISTICS OF INFLUENZA-VIRUS STRAINS ISOLATED IN 1957

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IN the spring and summer of 1957 there were many large outbreaks of influenza in the countries of South-East Asia. The influenza-virus strains isolated by Dr. Chu in Peking and Prof. J. H. Hale in Singapore proved, after the complement-fixation test with the soluble antigen, to belong to type A; they differed greatly, however, from previously isolated strains in the hæmagglutination-inhibition test.*

There were occasional outbreaks of influenza in some regions of the U.S.S.R. in May, June, and July, 1957, mainly among children, students, and some industrial enterprises.

The clinical course was manifested in acute pyrexia up to 104°F, mild catarrh of the respiratory tract at the onset of the disease, and general intoxication. Children often had anorexia, vomiting, and diarrhœa. The patient's temperature dropped in four or five days, but often a second rise of temperature marked the onset of complications—e.g., pneumonia and otitis. Moderate leucocytosis was superseded by leucopenia in four or five days. The influenza was highly contagious.

TABLE I—ADAPTATION OF INFLUENZA-VIRUS STRAINS TO CHICK EMBRYOS

Strain	Chick embryo passage *				Titres of virus in fourth passage	
	I	II	III	IV	H.T.	Infectious titre in chick embryos
Iksha	5	10	20	30	1 : 160	10^{-7}
Ber-1	4	11	15	23	1 : 160	10^{-8}
Ber-2	3	12	17	29	1 : 160	10^{-8}
Chel	4	14	18	21	1 : 160	10^{-8}
Lipki	3	10	12	15	1 : 40	10^{-8}
Kratovo	2	11	13	16	1 : 80	10^{-8}

* In every passage 30 embryos were infected; figures show the number of eggs in which the virus was discovered.

In the outbreaks in June and July, we isolated 30 influenza-virus strains, 6 of which were investigated in greater detail.

Materials and Methods

Isolation of Virus.—Nasopharyngeal washings, obtained on the first and second days of influenza were put into glass tubes containing hormonal broth, frozen, and transported to the laboratory. After being filtered through cotton (placed in the syringe) the nasopharyngeal washings were concentrated, by adsorption on to guinea-pig red blood-cells, to a tenth of the initial volume. Penicillin 20,000 units per ml. was added, and the mixture was introduced in quantities of 0·2 ml. into the amniotic cavities of chick embryos aged ten or eleven days. After three days' incubation of the embryos at 35°C eggs were used for the next passages. Besides the amniotic passages, allantoic passages were made simultaneously by the usual method.

Antisera were prepared by the two-stage immunisation of rats with 2 ml. of the live allantoic virus by the intraperitoneal route with a two-week interval. The immunised rats were desanguinated in from twelve to fifteen days after the second immunisation.

TABLE III—ANTIBODY TITRES TO INFLUENZA-VIRUS STRAINS IN PAIRED SERA OF PATIENTS

Stage of disease	No. of sera investigated	No. of sera with moderate and high antibody titres to virus strains					
		A	A1	B	C	D	Iksha
Acute ..	182	36	127	42	27	18	0
Convalescent	182	36	127	42	27	18	180

Complement-fixation Test.—The virus was typed by the method of Yurikas (1953). Allantoic membranes minced and ground with sand in allantoic fluid were used as antigen. The suspension was centrifuged at 4000 r.p.m., and the supernatant fluid was used to effect the reaction.

Hæmagglutination-inhibition Test.—The titration of virus, the determination of the antigenic pattern, and the determination of antibodies in pairs of the sera of patients were done with chicks' red blood-cells in the usual way (Shubladze and Gaidamovich 1954).

Results

The isolation of the influenza-virus strains by amniotic passage in chick embryos was usually easy, but at the first the virus was not found in all the embryos; therefore undiluted amniotic fluid was used later for the first two passages. From the second or third passage onwards the virus was found in the allantoic fluid, and in the fourth passage its titre reached 1 : 40–1 : 160 in the hæmagglutination test and 10^{-5}–10^{-8} in the chick-embryo titration (table I). In the subsequent passages the virus titres remained within the limits of 1 : 160–1 : 32 in the hæmagglutination test and 10^{-7}–10^{-8} in chick-embryo titration.

All the isolated viruses had a common antigen with the viruses of the same type in the complement-fixation test.

To obtain more detailed data of antigenic pattern of the isolated viruses, experiments of cross-neutralisation

* Minutes of an informal meeting on influenza, Geneva, July 11, 1957, NN NHO 12/442/2.

TABLE II—ANTIGENIC PATTERN OF INFLUENZA VIRUSES ISOLATED IN SUMMER 1957 COMPARED WITH PREVIOUSLY ISOLATED STRAINS BY HÆMAGGLUTINATION-INHIBITION TEST

Sera	Old strains							New strains						
	A-Shklaver	A-PR 8	A1-(Ned.) 1956	A1-Mos.	B-Kri	C-Mos.-1956	D-Mos.-1957	Iksha	Ber 1	Chel	Ber 2	Lipki	Kratovo	A (Sing.) 1957
A-Shklaver	640	40	20	20	0	0	0	0	0	0	0	0	0	40
A-PR8	40	1280	0	0	0	0	0	0	0	0	0	0	0	20
A1-Nederland 1956	20	0	320	160	0	0	0	0	0	0	0	0	0	40
A1-Moscow-1956 ..	20	0	160	320	0	0	0	0	0	0	0	0	0	40
B-Kri	0	0	0	0	160	0	0	0	0	0	0	0	0	0
C-Moscow-1956 ..	0	0	0	0	0	160	0	0	0	0	0	0	0	0
D-Moscow-1957 ..	0	0	0	0	0	0	640	0	0	0	0	0	0	0
Iksha	0	0	0	0	0	0	0	160	160	160	80	160	80	160
Ber 1	0	0	200	40	0	0	0	0	0	0	0	0	80	160
Chel	0	0	0	0	0	0	0	80	160	160	160	160	80	160

TABLE IV—EXAMINATION OF VOLUNTEERS INOCULATED WITH IKSHA STRAIN

Volunteer no.	Isolation of virus after inoculation (days)				Antibody titres in hæmagglutination-inhibition test	
	1	2	3	4	Before inoculation	In 15 days
1	5/5	0/5	3/5	0/5	0	1 : 40
2	2/5	2/5	2/5	0/5	0	1 : 40
3	1/5	2/5	3/5	0/5	0	1 : 20
4	1/5	4/5	2/5	1/5	0	1 : 80
5	2/5	1/5	2/5	0/5	0	1 : 40
6	1/5	2/5	1/5	1/5	0	1 : 80
7	0/5	3/5	2/5	0/5	0	1 : 80
8	1/5	2/5	2/5	2/5	0	1 : 40
9	0/5	3/5	3/5	3/5	0	1 : 40
10	3/5	3/5	4/5	4/5	0	1 : 80

The denominator is the number of eggs infected, and the numerator the number of eggs with virus isolated.

by the hæmagglutination-inhibition test were made with the sera against A, B, C, and D viruses and three newly isolated strains (Iksha, Ber 1 and Chel). Besides viruses used for the preparation of the sera, the newly isolated virus strains Ber-2, Lipki, and Kratovo and the virus strains A (Nederland) 1956 and A (Singapore) 1957, which we obtained by the courtesy of Dr. C. H. Andrewes, were introduced into the experiment.

The results of these experiments are shown in table II in which the numerals are neutralisation titres of sera in the hæmagglutination-inhibition test. The strain A-Shklaver (isolated in 1949 in Moscow) resembles the A-WS strain, and the strain B-Kri (isolated in 1949 in Moscow) resembles the B-Bon strain.

It is obvious that the influenza-virus strains isolated in the summer of 1957 in the U.S.S.R. closely resembled each other and are similar to strain A (Singapore) 1957.

Paired sera were taken in 182 patients in observed foci, where the described virus strains were isolated. The first sera were taken at the beginning of the influenza, the second ones after three weeks. Each pair of sera was investigated by the hæmagglutination-inhibition test with virus strains A-Shklaver, A1-Moscow-1956, B-Kri, C-Moscow-1956, D-Moscow-1957, and Iksha (the type strain among the newly isolated ones). Antibodies against virus strains A, A1, C, and D were detected in many specimens of the sera taken at the beginning of the influenza in moderate (1 : 10–1 : 40) and high (1 : 80 or more) titres. Antibodies against the Iksha strain were never present; they appeared in the sera of some convalescent patients in moderate (more often) and high (rarely) titres. Antibodies to the previous strains did not increase (table III).

For the purpose of rapid preparation of a live influenza vaccine from the new strains, three of them were tested on volunteers to determine their capacity to develop and multiply in the mucosa of the upper respiratory tract, their immunogenity, and the reactions in vaccinated persons. To attain this end 0·5 ml. of the allantoic fluid of chick embryos infected with influenza-virus strains (fourth to sixth passages) was introduced into the nasal cavity of volunteers with a pipette. Nasopharyngeal washings from each volunteer were collected one, two, three, and four days after inoculation, and 5 chick embryos were infected with each sample of washings. The sera of vaccinated volunteers were obtained on the day of vaccination and a fortnight later to determine the antibody titres. Three influenza-virus strains—Iksha, Ber 1, and Chel—were tested, each on 10 volunteers.

The results of testing of the strain Iksha are shown in table IV.

The testing of two other strains gave quite analogous results. The virus was isolated most intensively two or three days after inoculation. The clinical reactions were moderate: 2 of the 30 vaccinated had pyrexia up to 101·3°F for two days, 2 up to 99°F for a day, and the 26 others had no pyrexia. They had moderate hyperæmia of the nasal mucosa for three or four days and did not feel seriously ill. Antibodies to the influenza virus used as vaccine increased in all the volunteers.

Discussion

The results of this investigation confirm the opinion expressed by Zhdanov (1954) that influenza viruses are continuously changing their antigenic pattern, and that the epidemic and pandemic spread of influenza is connected with the appearance of new antigenic variants.

The peculiarity of the influenza-virus strains isolated in the summer of 1957 is the important difference in their antigenic pattern from that of previously circulating influenza-virus strains of type A1. This difference, which may be discovered by the hæmagglutination-inhibition test, is so pronounced that one may reasonably name the new influenza viruses A2, because the difference is as great as the difference which was found in the viruses of the 1949–52 pandemic outbreak and led to their being named A1.

The complete absence of antibodies to these viruses in the population explains the high contagiousness of the influenza and allows us to expect a world-wide spread of "Asiatic" influenza, within the next few months. On the analogy with the 1949–52 pandemic outbreak one might suppose that the new viruses will become established everywhere in two or three years.

New influenza-virus strains may be promptly adapted to being developed in chick embryos, and they preserve the capacity to multiply in the nasopharynx of men and to provoke specific immunity after five or six passages. Their pathogenic properties during passages in eggs decrease so much that there is possibility of using them as a live vaccine. It is not unlikely that the use of this vaccine may present a real means of protecting the population against the possible pandemic outbreak of influenza.

Summary

Influenza-virus strains isolated in the summer of 1957 in the U.S.S.R. belong to type A, shown by complement-fixation test with S antigen, but the hæmagglutination-inhibition test shows that they differ considerably from previously isolated viruses of type A.

The antigenic similarity of these viruses to A (Singapore) 1957 strain has been proved.

The people investigated had no antibodies to the new influenza-virus strains, whereas they had antibodies to previously isolated strains. This explains the high contagiousness of the influenza.

After four to six passages in chick embryos the pathogenicity of the new influenza viruses to man decreases, while the immunogenicity remains high.

It is possible to use the newly isolated strains for the preparation of a live influenza vaccine.

REFERENCES

Shubladze, A. K., Gaidamovich, S. Y. (1954) Short Course of Practical Virology. Moscow.
Yurikas, J. A. (1953) *Trans. Acad. med. Sci. U.S.S.R.* **28**, 138.
Zhdanov, V. M. (1954) *J. Microbiol., Moscow.* no. 9, p. 56.

Influenza

The epidemic is now making itself felt in Southern England, where half the pupils in some schools have been absent and certain London postal services affected, and in Scotland. In Glasgow last week, the daily average of children absent from school was 52,750. Last week there were 20 deaths in Manchester from influenza, compared with 15 the week before. The numbers of deaths notified

in the 160 great towns of England and Wales for the five weeks ending Aug. 24 to Sept. 28 inclusive were 6, 2, 47, 121, and 282. The aggregate was 466, compared with a range of 11–23 for this period in 1953–56. Notifications of pneumonia in England and Wales in the weeks ending Sept. 14, 21, and 28, were 205, 195, and 292. Claims for National Insurance totalled 408,379 in the week ending Sept. 24; the figure for the previous week was 223,170, and for the corresponding week last year 142,795.

The first batch of vaccine, enough for 65,000 doses, was issued to hospital authorities on Oct. 1.

Welfare Food Changes

Reports have appeared in our columns of hypercalcæmia, which is often caused by excessive dosage of calciferol; and the Cohen Committee [1] recommended such reductions in the level of fortification with vitamin D in welfare foods and supplements that a child having only one supplement should get enough, and a child having several should not get too much. The Minister of Health and Secretary of State for Scotland have now arranged for the vitamin-D content of National dried milk and of welfare cod-liver oil to be reduced to an average of 100 units a dry ounce and 100 units a gramme respectively—about the figures recommended by the committee. Manufacturers of proprietary dried milks and infant cereals have been asked to reduce the fortification to an average of 300 units per oz. Deliveries of National dried milk containing the new levels of vitamin D are expected to start in mid-October, and those of cod-liver oil some weeks later.

The committee also recommended that free distribution of orange juice to children aged 2–5 years should be abandoned; and this has already been implemented.[2] It recommended no change in the provision of vitamin A and D tablets to pregnant and nursing women.

National Smoke Abatement Society

In his presidential address to the society's conference in Hastings last week, Dr. R. Lessing said that dedusting processes in coal preparation could remove much of the dust and grit that finds its way into chimneys. The sulphur inherent in the coal could not be removed, but much sulphur refuse could be washed out, and this was financially possible. If sulphur were removed from coke, the amount of ash would be reduced; and this reduction of their daily chores would help to popularise smokeless fuel among housewives.

Sir Graham Sutton, in his Des Vœux lecture, said that irregular winds made cities possible; if man were denied this automatic mixing of air, he would be poisoned by his own by-products. Temperature inversion "kills the wind"; in such conditions smog does not disperse, leading to disasters like the one in London in December, 1952. Turning to the source of smoke at ground level, he pointed out that if the height of a chimney-stack is doubled, the concentration of smoke on the ground is reduced to a quarter. Domestic chimneys, which were many and near the ground, contributed far more to the smoke nuisance than industrial chimneys.

Among the papers read at the conference [3] was one on road-vehicle engines by Mr. H. E. Styles and Mr. A. T. Wilford, who said that diesel fuel might contain up to 1% of sulphur, though much of it could be removed (as a valuable by-product) by refining. On the other hand, a diesel engine working efficiently produced no more than a trace of carbon monoxide, whereas a petrol engine could not be run efficiently without producing significant amounts. Mr. G. G. Don, of the London School of Hygiene and Tropical Medicine, suggested that smokeless zones should begin at the edges of cities and work inwards, rather than the reverse. Mr. A. Marsh said that over 100 local authorities were considering plans for smoke-control areas, and over 30 orders had been submitted for approval; but the aggregate area fell far short of the 300,000 acres envisaged by the Beaver Committee. The cost of grants for conversions was more evident than the probable savings in cash, health, and amenities. "It is not generally understood that it is much cheaper to spend money on clean air measures than not to do so." Some authorities mistakenly believed that they could take no action against industrial smoke until the end of the seven years' defence relating to structural changes; others moved slowly because they were uncertain about the supply of smokeless fuels. Mr. Marsh hoped that so many smoke-control areas would be named that they would threaten to cause a shortage of smokeless fuel and stimulate increased production. Mr. Marsh ended his report by saying: "Orders will not be given Ministerial approval unless fuel supplies are adequate, and a long queue of such Orders waiting for approval is perhaps the best way of ensuring that production is being continuously expanded."

1. See *Lancet*, Aug. 3, 1957, p. 229.
2. *Ibid*, Oct. 5, 1957, p. 687.
3. Obtainable from the National Smoke Abatement Society, Palace Chambers, Bridge Street, London, S.W.1. Pp. 44. 10s.

Registrar General's Quarterly Return

In the quarter ended June 30, births in England and Wales exceeded deaths by 67,214—the biggest figure since 1949.[1] In areas corresponding to the New Towns, the birth-rates (as might be expected) are well above the national average. The national birth-rate was 16·6 per 1000 population, the death-rate 10·6 per 1000 population, the stillbirth-rate 22·5 per 1000 total births, and the infant-mortality rate 22·2 per 1000 related live births—the lowest ever recorded for a June quarter.

3253 people died in accidents in the June quarter; 1396 of these deaths were at home, and 1228 in transport. These figures are all less than the corresponding ones for last year. Of the deaths at home, 149 were from burns and scalds and 929 from falls. There were 158 deaths from drowning, more than half of them in children under 15.

The report gives provisional figures for causes of death in 1956; there was a record low number of deaths from measles (30) and diphtheria (8). There were 5375 deaths from tuberculosis, compared with 6492 in 1955 and 23,468 in 1945. But 74,790 (70,597) people died from coronary-artery disease, 29,670 (28,793) from bronchitis, 18,186 (17,272) from lung cancer, and 2315 (2224) from leukæmia (previous year's figures in parentheses). The number of deaths from suicide (5282) in 1956 was the highest ever recorded. Of the 114 deaths from acute poliomyelitis, 66 were of persons aged 25 or more.

There is a table showing the loss of expected years of life in 1956 due to mortality from various causes. For every 10,000 men aged 15–64, 114 years of working life were lost through cancer (including 39 through lung cancer), 87 years through accidents, 80 years through bronchitis and pneumonia, and 78 years through coronary-artery disease.

1. Registrar General's Quarterly Return for England & Wales. Quarter ended June 30, 1957. H.M. Stationery Office. Pp. 28. 1s. 6d.

Infectious Diseases in England and Wales

Disease	Week ended September			
	7	14	21	28*
Diphtheria	1	2	3	1
Dysentery	220	213	174	202
Encephalitis:				
Infective	2	6	2	7
Post-infectious	1	2	3	5
Food-poisoning	223	260	240	142
Measles, excluding rubella	2073	1240	1047	981
Meningococcal infection	32	18	30	20
Ophthalmia neonatorum	20	38	26	20
Paratyphoid fever	12	15	19	5
Pneumonia, primary or influenzal	207	333	702	1367
Poliomyelitis:				
Paralytic	159	116	117	87
Non-paralytic	122	84	85	37
Puerperal pyrexia	218	237	248	274
Scarlet fever	272	323	321	305
Smallpox	..	..	..	..
Tuberculosis:				
Respiratory	502	473	523	531
Meninges and C.N.S.	11	8	4	12
Other	58	61	51	63
Typhoid fever	6	4	6	9
Whooping-cough	1015	779	726	564

* Not including late returns.

Special Articles

GROUP TEACHING IN MENTAL HEALTH

THE WIDENING CIRCLE

HOWARD JONES
Ph.D. Lond.

THE importance to mental health of satisfactory early experiences within the family is now generally accepted, and the need for more education of the parents of young children is clearly urgent. But it is doubtful whether formal classes of the "preparation for parenthood" type are the best means of providing it. To parents, these often seem remote from their own experience, and too reminiscent of the schoolroom and the textbook. In 1954, as an experiment, with the coöperation of the Workers' Educational Association, I started to hold classes which should deal with the practical problems which parents were meeting in their own families. I hoped that in classes of this kind the tutor would be able not only to teach but also to pick up ominous trends in family relations before they had had time seriously to affect the child's development.

Classes for Mothers

Afternoon classes on the psychological development and care of young children were organised among the mothers on a council housing estate. A nursery was provided in an adjoining room, staffed at first by a W.V.S. helper, and later by a social-science student, so that mothers with under-fives should not be prevented from attending. The classes began with a lecture, which was followed by questions and discussion. The course might have met the needs of the mothers better if it had consisted entirely of discussion centred around their own problems, but it was felt that lectures would be more readily accepted and understood as a way of obtaining information. It might indeed have been some time before members realised that the discussion was helping them, and meanwhile attendance would have dwindled. There was also the danger that too much concentration on personal problems might unleash strong feelings and that if there were any very disturbed mothers present the psychotherapeutic element might have to loom too large. But the lectures were always based on the real problems of this group of mothers, and were kept short enough to leave plenty of time for free discussion. In the classes we tackled problems of physical, intellectual, and emotional development and compared different methods of training children. Thus it was possible to discuss breast-and-bottle, demand, and clock feeding, the origin and significance of feeding difficulties, toilet-training, learning to walk and talk, the tantrums of the two-year-old, and the nightmares of the three-year-old.

The classes clearly met a need. The attendance was small, but regular; books were borrowed and read. The lectures were followed attentively and in the discussion the mothers related them to their own experience or that of their neighbours. They often asked for more information on particular topics.

The discussions were valuable as a means of sharing experience and of enabling the tutor to develop his subject-matter to meet the needs of the group. A woman who had older children would have much to teach younger mothers, going through crises which she had successfully surmounted. The mothers accepted such help more readily from each other than from the tutor, for they felt that it was based on practical experience rather than theory.

The discussion did not focus exclusively upon the problems of the children. Often a mother would find herself describing her own attitudes and feelings towards the child, and she seemed to find great relief in doing so, especially as she received understanding and sympathy from the other mothers, who interpreted her feelings to her, and discussed how far they were justified by the difficulties she was facing.

Two of the mothers were of a very anxious disposition. One of these found comfort and support in the class, came regularly, and made slow progress in her own personal adjustment and in her skill as a mother. The other was tense throughout the meetings. She would sit on the edge of her seat, as near the door as possible, listening intently to the noises from the nursery in case her own toddler should be crying. The tutor persuaded her to talk about her anxiety, and the other mothers discussed the matter soberly and sensibly, but in a rather more direct way than she was able to tolerate. They were not hostile, but in fact rather compassionate; but they did discuss *her* anxiety and *her* child, and though she had been attending regularly for about fifteen weeks, she never came again. Clearly the insight-giving activities of the group must be checked when they begin thus to threaten the sense of security of a member, unless the tutor can give her the support necessary to enable her to ride the storm.

The nursery allowed the mothers a brief rest and change of activity. It also gave a weekly opportunity for supervised social experience for the children, and enabled the mother to see her child more objectively, and watch how it reacted to some other adult and to other children. The child's behaviour in the nursery was brought into discussion in the group. When related to the feelings and wishes expressed by the mother in the group, the child's attitudes (aggressive, anxious, or tension-free) became much more intelligible.

Wider Repercussions

Any attempt to change attitudes within a group eventually face the stresses which such changes set up in the wider community,[1 2] and even our modest experiment had its wider repercussions.

Husbands

As was to be expected, mothers discussed the work of the class at home with their husbands, and these often became interested. They read the library books which their wives brought home, and one even turned up at a class.

Health Visitors

The mothers also began to question the advice given by the health visitor which laid more emphasis on hygiene than on psychology. The health visitor in question was thus made to feel insecure, and she became hostile towards the class.

To meet this situation I decided to try to organise a course for the health visitors themselves. If they had a better grasp of psychological factors, I felt that these workers might well become the main agency through which the education of mothers could proceed.

The health department was approached, and, as the medical officer was already considering starting courses in mental health for the health visitors, he was most coöperative. A short course was therefore arranged with the adult education department of a university as part of the health department's in-service training programme.

About thirty health visitors attended the classes, and proved to be intelligent and responsive students. Most of them made rapid advances in understanding, and were soon carrying their new-found insight into their work. They became much more ready to consider the possibility of psychological causes in such problems as incontinence or fretful behaviour. It was not that they had not known theoretically that such causes could

1. Bion, W. R., Rickman, J. *Lancet*, 1943, ii, 678.
2. Jones, H. Thesis for Ph.D. degree, 1953. London University Library.

exist, but these had previously enjoyed a mere verbal existence. Now, through the discussion of actual cases, they had emerged as realities.

But just as the changes in the attitudes of the mothers in the original class had their impact on the health visitor, so did the changes in the attitudes of the health visitors, in their turn, have repercussions. For example, a health visitor, trying to obtain psychological treatment for a child might be frustrated by the attitude of a general practitioner with an old-fashioned approach to what he was inclined to call "just nerves."

Within the health department itself, the health visitors' new-found liberal views on child-rearing began to clash with those current in the local day-nurseries. Some health visitors even began to challenge the use of day-nurseries at all, on the ground that the separation of a child from his mother for long periods every day was psychologically undesirable. The health visitors' class seemed likely to lead to stress between the professional groups.

It became desirable therefore that classes should now be organised for day-nursery matrons, and at the request of the health department such a course was started.

Nursery Matrons

In organising this course I faced a difficulty. I believe that day-nurseries are psychologically undesirable, at least for children under three. At the same time I recognised that the local nurseries were economically essential, both for many mothers (who needed the money they were able to earn at work), and for the local industries (which needed their labour). Obviously, if day-nurseries were necessary, they ought to be run in such a way as to provide as favourable an environment as possible for the child, and it was to this end that the matrons' course was directed. The child's need to satisfy the emotional side of his nature was emphasised, and the inadequacy of a purely medical approach in terms of physical needs. Norms in child development were discussed to show that training should be appropriate to the child's age and development. (Some of these well-trained State-registered nurses were surprised how late were some of the established norms—such as those for bowel and bladder control. They must have been operating previously on the assumption that these skills ought to be attained at an earlier age than the normal.) The needs of the individual child were emphasised and the dangers of institutional methods of caring for children were explained.

It is difficult to say how much progress was made with this group, and a later joint course for health visitors and matrons has occasionally thrown up evidence that fundamental disagreement between the two groups still exists though their earlier (nursing) training was identical. The health visitors have expressed the view that the chief drawback to their own social and psychological understanding was their hospital training. In hospital, they said, doctors and nurses are cut off from the realities of life in the outside community and develop attitudes which they have afterwards to modify when they go out into the community to work, as general practitioners, health visitors, or Queen's nurses.

Conclusions

This experiment has shown that mental-health classes, organised as a combination of lectures and discussions, can be effective. The lecture gives the session direction and purpose, and the discussion orients it towards member's needs, and enables ideas which would otherwise arouse powerful resistance to be gradually assimilated. But the tutor must expect opposition from the surrounding community and must be prepared to organise further classes for appropriate groups.

Health visitors hold a key position for improving the mental health of the community. Not only could they run classes for mothers in their districts, but at their home visits and their sessions at infant-welfare clinics they could help mothers to deal with their current difficulties. The health visitors are the "gatekeepers" towards whom the education should first be directed.

RUNNING COSTS OF HOSPITALS

A REPORT TO THE HOUSE OF COMMONS

HAVING taken evidence through a subcommittee of half a dozen Members of Parliament, with Mr. Godfrey Nicholson in the chair, the Select Committee on Estimates have produced for the House of Commons their opinions on the running costs of hospitals in England and Wales.[1]

They point out that hospital boards and committees, composed of voluntary members, are entrusted with expenditure of public money under one of the biggest single subheads of the Civil Estimates, and that Treasury control of this expenditure is only general and necessarily indirect. The actual net running costs of hospitals rose from £189 million in 1949–50 to £293 million in 1955–56, but the total load borne by hospitals also rose, as the following figures show:

	1949	*1955*
Inpatients (all hospitals):		
Average daily bed occupation	397,570	426,047
Discharges and deaths	2,936,980	3,651,978
	1949	*1955*
Outpatients (all hospitals):		
New patients	6,147,825	11,635,886
Total attendances	36,109,208	39,584,241

Of the increase in annual expenditure, £69·2 million is attributed by the Ministry of Health to increases in pay, increases in prices, and other unavoidable increases. Of the remaining £34·6 million, the major part was presumably devoted to developing and expanding the service to enable it to carry its increasing burden. As the real cost per inpatient per week rose little, the apparent improvement in standards of service must have mainly been financed by economies resulting from increased efficiency, skill, and individual effort. The committee are satisfied, therefore, that there is no evidence of declining efficiency in spending the money, nor do they believe that there is much, if any, gross inefficiency or obvious waste. But there is still scope for bringing about true economies, in the sense that better value can be got for the money spent.

"Expansion and improvement are no doubt most urgently needed, but that does not mean that unlimited expansion, either now or in the future, should be the basic assumption of those responsible for expenditure within the service. Therefore it is essential that all in the hospital service should recognize that if expansion is to take place in one sector, a standstill, or even contraction, may be involved elsewhere. Everyone in the service must be convinced that whenever he is able to achieve some saving he will be enabling someone else (if not himself) to carry out some improvement in the service that might otherwise be deferred. Your Committee believe that through such a sense of mutual benefit from economies the true efficiency of the service is best ensured; the question is whether such a sense is universally present today."

CENTRAL PLANNING

Crediting the hospital boards and committees with a high degree of local autonomy, the committee say that, because the Ministry's opportunities of direct control are so limited, it must show vigour and foresight in using its powers of planning, guiding and advising, and in particular of allocating money. They were disappointed to find that few conclusions had been reached by the Ministry on some of the cardinal problems affecting the service, such as the lack of a career structure for administrative staff, how to bring about greater coöperation between management committees over purchasing and various services, and how to avoid the unnecessary use in some cases of hospital facilities.

1. Sixth Report from the Select Committee on Estimates. Session 1956–57. H.M. Stationery Office. Pp. 423. £1.

NON-MEDICAL STAFF

Appointments.—The Guillebaud Committee reported that "a proper career structure" for administrative staff "is a matter of the utmost importance for the well-being and efficiency of the service"; but, though the service came into being nine years ago, the Ministry has only lately taken positive action.

Quoting a regional board's statement that it was "very unhappy" about the appointment of certain senior officers of management committees, especially where "the local boy has been appointed because of pressure of the local group," the committee questions whether the system of appointment is as good as could be devised. To ask regional boards to appoint to these posts would cause grave distress to management committees, who regard their right to appoint their own staff as an important element in the discharge of their responsibilities; but the committee hold that representatives of regional boards should always be invited to attend meetings of management committees when group secretaries or group finance officers are being appointed.

Salaries.—The salaries of group secretaries, finance and supplies officers, hospital secretaries, matrons, and chief male nurses, and of their deputies are based mainly upon the numbers and types of beds of their group or hospital. It has been suggested that in this and other ways "the whole service . . . is geared to move only one way—towards expansion."[2] The committee recommend that "formulæ should be devised to enable other objective criteria, in addition to the number of beds, to be given greater weight when assessing the salaries of hospital administrators."

Control of Establishments.—Because the number of medical staff employed is closely associated with the Minister's and regional boards' plans for development of the hospital service, the committee thinks that the present establishment controls should be retained for them. But the ceiling control over nursing and midwifery staff and other staff, and the detailed control over administrative and clerical establishments, are no longer valuable. Where present figures are below establishment, increases in numbers may be positively encouraged by a belief that the hospital ought to recruit up to its establishment. Furthermore, the imposition of these direct controls from above can cause a sense of frustration and, possibly, antipathy between authorities. The evidence indicates that budgetary control would now suffice.

FINANCIAL CONTROL

The maintenance allocation of money to regional boards is based on what the boards spent in the previous year. Hospital expenditure is thus linked to an "inherited pattern." In this way, while a check is kept on unrestricted growth, inefficiency, or lack of proper economy may go unchecked, and variations in costs as between region and region may also tend to become entrenched. The Minister's policy is to reduce these variations, and the committee are glad to note that they have been reduced from a total variation of 35% in 1951–52 to a total variation of 20% in 1955–56. But they are still too wide, and it should be the object of the Minister to break away from this inherited pattern. The committee recommend that the fullest use of departmental costing should be treated as a matter of the highest priority, and that as soon as these returns are available the Minister should take them and other criteria for measuring efficiency into account, when making his annual allocations to regional boards in respect of developments.

Organisation and Methods Service.—Even with the new objective costing, difficulties of interpretation will emerge because of variations in circumstances—nature of area, type of building, availability of staff, and particularly type of case treated. These can be considered subjectively only by experts, medical and lay, in hospital administration. The experimental use of Ministry of Health O. & M. teams appears to have been very successful, and the committee believe that this service should now be put on a permanent basis and expanded to cover the hospital service as a whole.

Virement and Expenditure on Developments and Improvements.—The committee were disquieted by evidence which suggests that, by the exercise of virement, hospital authorities may sometimes be managing to develop the services in their regions or groups in a way which may be contrary to the intentions of those responsible for planning national and regional development. They welcome the control exercised over development and improvement expenditure by regional boards, and they appreciate the Minister's hesitation to impose any more direct control over regional-board expenditure although he now specifically earmarks part of the allocation for building maintenance. They also welcome the Minister's weighted distribution of the small amount of money available for developments and improvements, although they wonder whether a rather larger share could not be given to the low-cost regions.

"But if the operation of the Minister's planning powers is to be effective in this respect, development must take place, by and large, as he plans it. Your Committee recommend, therefore, that Regional Hospital Boards, by their exercise of the power of sanctioning virement, should not incur recurrent expenditure by permitting developments or improvements to be undertaken in excess of the sum envisaged by the Minister in his initial allocation, without financing such extra developments or improvements by savings whose effects are equally recurrent."

Costs and Standards of Teaching Hospitals.—The average acute London teaching hospital has an inpatient cost per week of £27, and an inpatient cost per case of £67, the equivalent figures for the average acute 301–900 bed non-teaching hospital being £18 and £41 respectively. Since the inception of the service there has been some slight redistribution of available resources away from teaching hospitals, for their share of total revenue expenditure fell from 14·5% of the total in 1949–50 to 13·6% in 1955–56. But the committee feel obliged to recommend that "until the standards of non-teaching hospitals reach a significantly higher level, the allocation of development and improvement money to teaching hospitals should continue to be strictly limited."

Definition of Capital.—The committee are glad to note the extra amount of capital that is being specially designated for revenue-saving schemes. "A particular field for revenue saving capital expenditure on a small scale is non-medical equipment, such as modern and labour saving equipment in laundries, kitchens, and administrative and accounts offices. As capital is at present defined some such installations, and also such things as replacement of boilers, may not be financed out of revenue account." The committee therefore recommend that the definition of capital should be relaxed to enable management committees to finance small revenue-saving projects out of savings in running costs.

"MATTERS IN RELATION TO WHICH THE MINISTER CAN GIVE GUIDANCE AND ADVICE"

The Domiciliary Consultative Service.—While appreciating that this service can reduce the demands on hospital beds, the committee are concerned about its possible abuse.

"There appears to be some laxity on the part of general practitioners in unnecessarily asking for domiciliary visits and particularly about attending domiciliary consultations. The Committee were surprised to learn that out of 2627 visits made by whole-time consultants in the S.E. Metropolitan Region between November, 1955, and December, 1956, the practitioner was only present in 38 per cent. of the cases. It appears that the requirement of the Terms and Conditions of Service for Hospital Medical Staff is not being complied with in this respect, as they include the provision that the general practitioner should normally accompany the

2. *Lancet*, 1956, i, 237.

consultant on domiciliary consultations for which a fee may be paid. Your Committee recommend that the Minister should institute an enquiry into the domiciliary consultative service to determine the extent, if any, of misuse, and to recommend what controls, if any, are required to prevent abuse."

Drug Expenditure and "Cost-consciousness."—The Ministry and hospital authorities are themselves worried about the rising drugs and dressings bill and have taken steps to supervise prescribing or to enlist the coöperation of the medical profession.

"One of the most effective ways of doing this is for Management Committees and Boards of Governors to place the responsibility for keeping down a hospital drug bill upon the medical staff of that hospital collectively, through the medium of the Medical Staff Committee. At the same time Your Committee cannot entirely accept the view that the control of drug expenditure must be left exclusively to the doctors.

"Your Committee believe, however, that true economy in this field can only be achieved when doctors are fully cost-conscious, and appreciate the advantages that can accrue to the hospital service as a whole by a strict avoidance of extravagance in the use of drugs. Witness after witness before the Sub-Committee—medical as well as lay—referred to the lack of cost-consciousness among doctors, although the representatives of Guy's Hospital were not so critical, and the Royal College of Physicians thought that the situation was improving. The Ministry have been aware of this problem for several years, and since 1950 have taken steps to inform doctors in the hospital service, and, since 1953, in medical schools, of the costs of drugs. The profession should also be aware of the financial state of the service through their representatives on Boards and Committees.

"Apparently this has not been enough. Your Committee believe that the problem can only be solved at the source—by ensuring that no medical student qualifies as a doctor without being made aware of the financial responsibilities of his position in the Health Service, and of the costs of the treatments he will have to prescribe. . . . In the interests of economy throughout the Health Service they recommend that the Minister should urge upon all medical and dental schools and teaching hospitals that medical students, before qualifying as doctors, surgeons or dentists, should be required to satisfy their examiners that they have a proper knowledge of the financial structure of the National Health Service, and of the costs of treatment for which they may be responsible."

Amenity Beds.—The committee state that in 1955, for all hospitals, only 46% of amenity beds were so occupied although 33% were occupied by other patients. They recommend that the Minister should call upon all hospital authorities who have such beds to do all they can to encourage their use by paying patients.

LOAN BORNE BY THE HOSPITAL AND SPECIALIST SERVICE

In the interests of the hospital service the Department should do all it can to ensure that expensive hospital facilities are devoted only to those sick people who are truly in need of them. There are five main problems:

1. Some patients attend as outpatients for specialist clinics, who could well be examined and treated by general practitioners.

2. Some patients are unnecessarily retained as outpatients, for treatment by consultants, who could be referred back to their general practitioners for treatment.

3. There are cases of people being admitted for observation who could attend as outpatients if facilities (such as a rest room) were available.

4. A certain number of chronic sick are retained in acute wards (where costs are higher) because of the shortage of chronic beds.

5. "Lastly, and most tragic, there are those patients in chronic sick beds who cannot be discharged because other suitable care and accommodation are not available (approximately 4500 in 1955), and the 10,000 old patients in mental hospitals whose degree of mental health is such that they could appropriately be discharged if there were someone to care for them."

For the solution of these problems it appears that formal consultation between the three branches of the Health Service at the periphery has not really succeeded.

"The answer, undoubtedly, lies partly in extending such services as the maternity and child welfare services, the home nursing service, the use of mental welfare officers, and the provision of home helps, as well as an expansion of certain types of hospitals and wards. But eventually hospital authorities, the general practitioners, and the local authorities must all work together if the limited resources of the hospital service are not to be wastefully employed on the care, attention or treatment of those who are not truly in need of them."

The committee conclude by reiterating their belief that if full value is to be obtained for the large sums of public money that are spent every year, more time and attention must be devoted to long-term planning. "They have been impressed by the devotion and enthusiasm that prevails throughout the service. But they have also been depressed by the apparent lack of vigour with which some fundamental problems are being faced by the Ministry."

MEDICAL PROTECTION SOCIETY

"SOME friendly cautions to members" were given by Sir ERNEST ROCK CARLING when he presided over the society's annual general meeting on Oct. 2.

Of those addressed particularly to dental surgeons, the first concerned the cases—still encountered despite all precaution—in which the patient, during extraction of teeth, inhaled part of a tooth or even part of an instrument. Sometimes the dentist was in doubt as to whether the missing part of a tooth had been inhaled or swallowed; and he might even call at the patient's home next day to make sure that all was well. But this was not enough: cough or other symptoms might not declare themselves for several days. Wherever there was any doubt at all, an X-ray examination was essential. Another of Sir Ernest's dental cautions was a plea to make sure that instruments were in order—a plea arising from several cases in which faulty discs have damaged gums or other soft tissues. And whenever payment for dental work is expected, he said, it is important that a written estimate should be submitted.

In one of many instructive cases recorded in the annual report, the vein chosen for blood-transfusion, at a point 1½ in. above the wrist, turned out to be the radial or musculospiral nerve. This nerve, Sir Ernest remarked, "seems to have an extraordinary attraction for the end of a needle." To the anæsthetist and surgeon he appealed for restriction of the use of relaxants to operations in which they are really essential; as potentially dangerous agents they should be treated with great respect. "And finally," he said, "a reflection born of seniority." It was very necessary that doctors on the staffs of hospitals should give their juniors ample opportunities to practise and learn. But the junior to whom work was delegated was exposed to claims for damages. The senior who tried to educate his juniors was doing the right thing, but he must make sure that he was not asking them to do something for which they were not fully competent. By tradition the senior would take responsibility for his junior's acts; but this was a matter now "partly gone out of our hands."

For the first time since 1951, the society's expenditure last year exceeded its income—the deficit being explained by the larger sum paid in costs and damages, which rose from £21,000 in 1955 to £32,000 in 1956. Mr. W. G. Hawkins, of Messrs. le Brasseur & Oakley, the society's solicitors, said that though the membership had risen during recent years (it is now well over 30,000) the main reason for greater expenditure was the reduction in the value of money: the case which a few years ago would have been settled for £500 now cost £1000. So far from indicating that doctors and dentists were becoming less competent, the continuing increase in claims was, in his view, evidence of their capacity to use means of diagnosis and treatment formerly unknown. As the competence and capacity of doctors increased, they became more and more liable to actions for negligence when they failed to live up to the very high standards they themselves had set.

The society's officers were re-elected—Sir Ernest Rock Carling as president, Mr. W. M. Mollison as treasurer, and Dr. A. R. French as secretary. The chairman of council is Dr. F. Harwood Stevenson, and the deputy

secretary Dr. H. A. Constable. The offices, from which the last annual report may be obtained, are at Victory House, Leicester Square, London, W.C.2.

Conferences and Congresses

LIVING AND WORKING CONDITIONS AND HEALTH

A CONFERENCE on the Influence of Living and Working Conditions on Health, held at Cannes from Sept. 27 to 29, was attended by some 250 doctors and scientists from thirty-three countries. Prof. J. PARISOT (France), former president of the World Health Assembly, and Prof. J. DE CASTRO (Brazil), former president of F.A.O., were joint presidents.

Nutritional Factors and Disease

Professor DE CASTRO said that there were still many conditions under which simple lack of food played the predominant, though not necessarily exclusive, rôle in the causation of illness. As gross deficiency diseases receded, partial or subclinical forms were becoming more important. The ecology of nutritional influences was changing as many countries moved to a more developed state. The populations of such countries should be careful when tempted to take over dietary patterns exactly from more advanced countries.

Dr. YANG-EN-FU (China) evaluated the high-cereal diets customary in his country. Analyses of amino-acid content, together with observations on the retention of nitrogen in man, had led to a more optimistic assessment of the quality of the vegetable protein in this diet, and it was concluded that substitution of animal protein was less necessary than has been supposed. Deficiency of vitamin A, riboflavine, and calcium (and not lack of protein) was thus the main problem in the high-cereal diets. Since the vitamin and mineral deficiencies could not be corrected adequately by increasing meat production, it would be more practicable to provide fortified local vegetable foods, particularly for children.

Dr. CICELY WILLIAMS (Britain) presented strong reasons, largely from her own experience, for moving away from a simple conception of food-supplies, and for placing increased emphasis on food usage. A total analysis of any situation was required, and it might be found that obstacles due to previously unsuspected local tradition, prejudice, or other social factors could thereby be removed. Imbalance of diets might arise not only from chemical and biochemical disproportions but also from less-understood causes, many of which could be studied clinically only in relation to environment. Emphasis on the needs of young people was essential in such field studies.

Dr. P. D'ARCY HART (Britain) reported that an investigation in India was aiming to discover whether some of the new chemotherapies might be effective enough, even in malnourished persons, to be worth organising cheaply and reasonably widely in areas of high tuberculosis prevalence alongside general social and nutritional measures. He thought it unlikely that drug treatment would do more than deal initially with the tuberculous process; for complete healing, as well as prevention of spread to contacts, the state of the host's defences was likely to remain important. Hence chemotherapy could be expected powerfully to assist, but not to replace, efforts to improve nutritional levels in such areas.

The conference decided on the formation of an International Medical Association for the Study of Health and Living Conditions and agreed on a constitution introduced by Dr. L. NORMAN (Britain); an executive council was elected. Presumably the new association, among its activities, will take over the recently started journal (issued in six languages) *Living Conditions and Health*.

In England Now

A Running Commentary by Peripatetic Correspondents

A PROBLEM of clinical life which doesn't hit the headlines much, but which causes a lot of grumbling at ground-level, is this business of telling the patient (and his loving relations) how long he is going to be in hospital. We all know the grouse: "Been 'ere three months I 'ave and they never warned me!" Meanwhile the chap's business has gone bankrupt and his wife's gone off with the lodger. The subject should be tackled on admission somehow, or as soon as possible afterwards, but there are usually difficulties. Often the first is to convince the disgruntled relations that you don't know, can't know, and even the presidents of the Royal Colleges and their councils couldn't know. This seems unlikely to them in the face of the family doctor's assurance that it would be for "just a few days only," a prophecy probably thrown out in an absent-minded moment or in an effort to persuade a reluctant patient to leave his homely comforts.

Surgeons, I suppose, can give a fairer forecast than most of their colleagues, and what's more they can usually bluff themselves out of anything. People sort of expect "complications" after operations. In all charity, though, I must admit that a surgeon can usually give a prediction to within an hour and get it right. He is trained to it from his earliest days: "Herniorrhaphy; up on the 10th day, discharge on the 14th": it becomes a Law of Life. Physicians, on the other hand, are up against it. What are we to tell a youngish chap with a couple of weeks' low fever and a shadow in his right mid-zone? It could mean a week on tetracycline, six months in a sanatorium, or pneumonectomy and death within a year. The truth to such a man is intolerable, and we are inhuman if we present him with the stark reality at this differential diagnostic stage. After all most of the patients admitted to medical wards come because we can't make up our minds on their diagnosis or treatment.

In psychiatry prognostication is even more complex. The patient is rarely indifferent to the probable date of discharge and may even ask for it to be carefully fixed before he will sign voluntary-patient forms. Diagnosis is easier maybe, but who can judge when the mania will subside or the neurosis resolve? The impression gained from recent TV programmes is often so erroneous that one may have to overcome the assumption that Uncle Alf with his chronic drug-addiction will be cured after one or perhaps two of those new shocks and arrive home in time for his birthday next Thursday. The best way to lose such a patient by suicide or discharge against advice is to tell him abruptly that you can't do much and he will be in hospital for at least six months. On the other hand you must not deliberately mislead him, let alone lie to him. "Have you better by next weekend" may keep him happy until next weekend, but thereafter you (and all other doctors he meets) are lost. A psychiatrist's most useful attribute here is a reassuring and informative way of saying almost nothing (one thing he has in common with a Civil Servant). Once your patient is settled into the ward and finds it's not as bad as he was expecting, that he is getting some treatment at last, and that there are a lot of quite nice blokes who have been in for a long time, he gets used to the idea of a longer stay than his family gave him to believe. By the end of the second week he stops asking to go home, and after that it's often quite a job to get him shifted out of the place when he's better.

This is not to say that the doctor's relationship with his patient should not be one of honesty and frankness: it should. I am sure that broadly speaking it is best to give the facts to the patient and his relatives in a full and intelligible way. But *when* and *how* to tell *what* to *whom*: these are the things in our Art that no-one will ever reduce to a Science.

* * *

We are always delighted to chat with our academic colleagues, and the other day when we met a preclinical friend of ours emerging from an unfamiliar building we were at pains to draw him out. It appeared that he had accepted the offer of the department of agriculture to put him up temporarily while repairs were being carried

out in his own department. Our friend is a shy man, and stands somewhat in awe of his adopted Professor, in whom many years of agriculture have matured an already hearty personality. Initially, therefore, our friend viewed his translation with some misgiving, and he was comfortably reassured to observe, standing in the entrance hall of the department, a fine brindled cow of about 2½ hands, entirely composed of some plastic material, and bearing on its face an expression of disinterested benevolence.

For a few days the matter went little further, and beyond nodding to the animal as he passed, our friend made no effort to ripen the acquaintance. One afternoon, however, as he conversed uneasily in the hall with his formidable host, a chance glint of sunlight revealed that the dorsal portion of the cow, including the tail, was detachable. Our friend's knowledge of cows is undeniably sketchy, and it came to him that his horizon would be considerably enlarged could he but remove the detachable portion and investigate what lay within. Clearly, however, the moment was inopportune, and the next day he was at pains to choose a time when nobody was about. The catch was a little stiff, and our friend was injudicious enough to give it a smart tug. With a resounding clatter the cow overbalanced and fell to the floor, retaining its benevolent expression but scattering plastic viscera in all directions. On all sides doors opened inquiringly, and our friend found himself surrounded by a crowd of interested and helpful agriculturalists.

Nothing was ever *said*, our friend tells us, but the cow has now been moved to the Professor's room, and he feels that the agriculturalists are watching him.

* * *

I am not sure what to think of those clever chaps in the World Influenza Centre who have been watching A/Asia/57 creeping up on us over the past few months. Their reports have been followed so closely by the newspapers that at any moment I have been expecting to see a rash of black arrows on maps, like an enemy's wartime troop movements.

All this intelligence has been too much for the more frail section of the local populace. They have had headache, backache, and the rest, retired to bed, sent neighbours round to the phone: "Mrs. R—— thinks she's got the 'Asian,' Doctor." Those who really do have it seem almost pleased that they are genuine and not hypochondriacal. I've had a subacute prodrome myself for the past three weeks, and can't decide whether to treat with tab. codein. co. or phenobarbitone.

Now the white arrows of the Ministry's counter attack are beginning to appear. Do you want an injection in three weeks' time, to be repeated one month later, against a virus which you first contacted three weeks ago? Please sign on the dotted line.

* * *

Our visitor from Scotland was greatly taken with an item on the menu:

Poached Fresh B.C. Spring Salmon

He told the waitress that in Scotland you wouldn't expect to see it stated on the menu that the salmon had been poached.

* * *

Lines on the Select Committee's proposal that medical students be required to satisfy their examiners that they have a sound knowledge of the financial side of the National Health Service before being allowed to qualify.

Now what is the cost of an aspirin, boy,
Compared with a Codeine Co?
And what do you pay
For a whole-plate X-ray
Of a colon that simply won't go?
How high is the price
Of a large lump of ice
For cooling an 'Oxygenaire'?
If a doctor's away,
Does he go on half-pay,
Or his Registrar give him a share?

If you really don't know,
Then you're certainly slow,
And something, I fear, of a dunce,
I sincerely advise
That this work you revise,
Before you come back in six months.

Letters to the Editor

CHRISTMAS GIFTS FUND APPEAL

SIR,—I am writing this appeal in the interim period between the resignation of Lord Webb-Johnson and the assumption of office by Sir Henry Tidy, our newly elected president.

Although we are now able to give far larger grants than in the past, it is difficult for your readers to realise what extraordinary joy and happiness the Christmas Gift brings to our beneficiaries.

I appeal most earnestly to all members of the medical profession to help to bring Christmas cheer into the homes of many of our less fortunate doctors.

Please send your contributions marked "Christmas Gifts" to the Secretary, Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15.

R. M. HANDFIELD-JONES
Chairman of the Committee of Management, Royal Medical Benevolent Fund.

MEDICINE AND THE DRUG INDUSTRY IN GERMANY

SIR,—If, as we suspect, your correspondent's article [1] was written after a short tour of the Federal Republic, it is understandable that he was not fully familiar with the facts, and was unable to judge the German pharmaceutical markets accurately. In any case, we believe that we owe both your readers and the subject itself some clarification of the position.

It is not true that the "red list" only "sometimes" gives both the composition and the indications for the proprietary products it lists. Both the composition and field of application of each individual product have always been given. The latest (1957) edition of the list gives for most of the products not only the qualitative composition but also the content of medically active ingredients. In this way the publishers, the "Trade Association," give every doctor precise information about the nature and content of the products he prescribes. In this connection, who can compel a doctor to prescribe remedies whose formula or scientific basis are unknown to him?

It is not true to say that in Western Germany over 500 small firms account for about 85% of the trade, whilst the remaining 15% of trade is done by the 30 largest firms. It would be interesting to know how your correspondent obtained these figures. It can be definitely stated that the well-known large or middle-size firms account for more than 50% of German pharmaceutical trade.

It is also wrong to say that mixtures of drugs have been "quite arbitrarily selected"—that is to say, marketed without previous research. Compound pharmaceuticals scientifically designed and practically tested are becoming increasingly important in Germany, as in Great Britain.[2] Their usefulness, particularly in ambulant practice, was emphasised recently by a qualified speaker at the "Heubnertag" in Karlsruhe. There may indeed be certain abuses in this field, but this does not reflect upon the German pharmaceutical industry as a whole. The Trade Association, however, is doing its best to bring about improvements in this respect. Its statute provides that:

"The members of the Federation have the primary obligation:
(*a*) to take special care in manufacturing and testing their products,
(*b*) only to market novelties in combination, action or indication after adequate pharmacological and clinical trials,

1. *Lancet*, 1956, ii, 1304.
2. Herxheimer, H., Whittet, T. D., Wilson, A. *Lancet*, 1954, ii, 42.

(c) to make known to all physicians and other medically qualified persons, details of combination, active ingredients and mode of action of their products,

(d) to avoid untrue, ambiguous or misleading statements in advertising and otherwise to refrain from unethical methods in competition.

Testing is certainly time-consuming and expensive. But it is out of the question to say that such tests are probably not carried out by more than 20 firms, although the scientific resources of individual concerns naturally vary according to their financial capacity. Besides the well-known large and medium-sized firms, there are many smaller concerns who, in their own laboratories, or in coöperation with university institutes, apply the same high standards to the development, manufacture, and sale of their products.

It cannot be denied that advertising by the pharmaceutical industry has increased in recent years. One of the reasons for this is that new knowledge resulting from the increased tempo of medical research has led to development of more new products. To attract the attention of the busiest doctors, increased effort has to be made to keep them adequately informed. Another important influence on the volume of advertising is the existence of fierce competition in the German pharmaceutical market, in which foreign pharmaceutical companies also play a significant part, aided by liberal trade regulations. Nevertheless, if a doctor obtains, from the information sent to him daily, only two or three ideas of value to a patient, and whose application may perhaps save a life, then this alone is sufficient justification for the volume of such information.

It is true that the West German pharmaceutical manufacturers sometimes come in for criticism by the scientists, a fate which they share with pharmaceutical producers abroad. The late Prof. W. Heubner, a senior German pharmacologist, criticised drug therapy during the last German Therapy Congress in September, 1956. It is, however, untrue that "neither the medical press nor the industry took much notice." On the contrary, representatives of the industry, both during the discussions at the congress and later in the medical press, discussed the arguments put forward in the lectures.

Certainly in Western Germany there are many medical journals. As there exist both good and bad products, so there are both good and bad journals. The general standard of the German technical press is, however, represented by those publications whose editorial staffs have a due sense of responsibility to the medical world and hence to the whole community. Furthermore, the medical journals are not exclusively or even predominantly concerned with therapeutics but deal with broader aspects of medical science for the better information of theoretical and practical physicians. Therefore, it is not a fact that material is used which "even first-class editing cannot transform into something valuable." Neither is it true that descriptions of new drug combinations fail to give all the constituents or their exact amounts. On the contrary, no new medicament is secret, either in part or as a whole; all published results of tests can be critically checked by any observer; and, as in the "red list," the details of the combination are indicated. Finally, it must be pointed out that a wide range of medical journals ensures that even apparently unimportant therapeutic advances receive serious scientific discussion at every stage.

Every scientific article has the same ultimate purpose as advertising by post and in the press—namely, keeping the physician's therapeutic knowledge up to date. The importance of this matter was emphasised by the chairman of the Senat für ärztliche Fortbildung at the 57th German Medical Congress in 1953 in the following words:

"In order that all shall share in new scientific knowledge and in new methods of healing, these must not be confined to a small privileged group, but should be made available without delay to every physician, even in the most remote village. The patient cannot wait for a new medical generation to grow up bringing with it knowledge of new discoveries from the universities."

The pharmaceutical industry of the Federal Republic is determined fully to support this fundamental aspect of the campaign against illness.

Frankfurt am Main. BUNDESVERBAND DER PHARMAZEUTISCHEN INDUSTRIE.

ESTIMATION OF PLASMA-PROTHROMBIN

SIR,—In your leader last week you state: "Owren has elaborated the one-stage technique by adding excess of factors V and VII; this seems of doubtful value since for control of anticoagulant treatment any depression of factor VII needs to be included in the estimation." It should be noted that Owren has never recommended this method for the control of anticoagulant therapy. In the method which he *does* recommend, the prothrombin and proconvertin (p and p) method, an optimum amount of fibrinogen and factor V are added to a diluted plasma system. This method is gaining increasing favour throughout the world and there is no doubt that it is superior to the unmodified one-stage test for the control of anticoagulant therapy. The reasons for its superiority are: that the test measures the combined deficiency of factor VII and prothrombin, that random variations are less than with the unmodified test, that the results are reasonably reproducible from one batch of reagents to another, and that the method records values in the near normal range. This last attribute may seem of little value, but the increased sensitivity emphasises trends into and out of the therapeutic range and facilitates the early choice of a balancing dose.

The Radcliffe Infirmary, Oxford. ROSEMARY BIGGS.

SIR,—I would like to correct a serious error in your leading article last week. You state that Owren has elaborated the one-stage technique by adding excess of factor V and factor VII. This, of course, is not so, as it would be impossible to control anticoagulant therapy if factor VII was added. In fact, in Owren's technique it is only factor V that is added.

In our anticoagulant unit here we have over the last eighteen months compared the value of Quick's, Owren's, and Ware's modification of Owren's technique in the control of anticoagulant therapy. In all, more than 2000 blood samples were tested and there appeared to be no doubt that Owren's technique (with minor modifications) proved definitely superior to the other methods for the control of anticoagulant therapy for inpatients. The value of Owren's technique as compared with Quick's method for outpatient long-term therapy is still under investigation. It is hoped to publish the results of this investigation in detail in the near future.

There is no doubt, as I have stressed for many years, that the basic essential for the proper control of anticoagulant therapy is a reliable thromboplastin. I feel sure that part of the value of Owren's technique is that he prepares a reliable thromboplastin with constant reproducible activity by a saline extraction of human brain. Owren states that an acetone-dried extract does not give constant reproducible activity, as does a saline extract. This is entirely in keeping with what I have advocated for many years, and I have always considered it entirely unnecessary to use an acetone-dried extract, as a saline extract gives more constant and reproducible results. A saline extraction of human brain is, moreover, much simpler to prepare than an acetone-dried brain extract, and it keeps absolutely stable for an indefinite period when stored at −20°C.

For the last seven or eight years in our unit, we have always reported results of prothrombin estimations as an absolute time in seconds; and always at the same time give the normal control value with the thromboplastin in use. To the clinician, expressing results as a prothrombin index, or as a prothrombin percentage, unless this is further qualified, is relatively meaningless. To anyone with knowledge of the laboratory techniques for the control of anticoagulant therapy, the most important factor is how active the thromboplastin is and what is the normal control time. If the normal control time is always given and with it the result of the test plasma reported in seconds, the clinician experienced in anticoagulant therapy has all the information he wants.

New End Hospital,
London, N.W.3. M. TOOHEY.

SIR,—In your leading article last week you emphasise the role of factor V and factor VII, but it is now accepted that the principal results of the administration of anticoagulant drugs in therapeutic doses are depressions of factor VII and X and to a lesser degree prothrombin.[1]

Alteration in protoplasmic viscosity is a determining factor in very many biological processes and is the basic response to stimulation; it has also been shown that the mechanisms of this sol-gel reversible reaction is analogous to that occurring in the fibrinogen-fibrin transformation and is controlled by similar influences.[2] The stimulation by increased environmental temperatures necessitates, in tropical climates, extra care in anticoagulant therapy.[3] There is also a rise in blood-heparin following stimulation by anaphylactic shock.[4]

Stimulation of the sweat-glands by wet thermal atmospheres over a period of 20 minutes [5] has been found to increase prothrombin-times. In 40 consecutive subjects the average rise was 2·3 sec., and in subjects given anticoagulants combined with sweating the average rise was 35·5 sec. in 14 consecutive subjects.

These observations suggest that further insight into the coagulation mechanism and into anticoagulant therapy may be derived from increased environmental temperatures, anaphylactic shock, and sweating.

Tunbridge Wells. E. F. ST. JOHN LYBURN.

HYPOGLYCÆMIC ATTACKS IN NORMAL INDIVIDUALS

SIR,—May I comment on Dr. Parkes Weber's most interesting experience described in his letter of Sept. 7? I agree that his attack near the Payer hut was almost certainly hypoglycæmic and the fact that he had similar attacks afterwards confirms this view, especially if, which is not quite clear, they occurred within a day or two of the first. The glycogen reserves become exhausted in the first attack and may not be replenished before the next exertion.

I am sure that chronic spontaneous hypoglycæmia, first described by Cammidge in 1930, is a clinical entity. The pathology is obscure, but there may be local or general hypertrophy of the islets; the condition is distinct from adenoma or carcinoma of one or more islets. I believe it to be fairly common and have notes of about twenty cases, confirmed by blood-sugar readings and glucose-tolerance curves, in addition to knowing many people who feel tired before meals or who really need a cup of tea and a biscuit at mid-morning.

None of my cases is so dramatic as that of Dr. Parkes Weber but none has been tried so highly. One woman went to sleep while preparing the midday meal; one young man (regrettably, a clergyman) went into "rages" and attacked his wife; a hospital carpenter had a fit when bicycling home to dinner. This last patient has been for many years on a sugar-free diet and has had no recurrence, although his blood-sugar, taken 3–4 hours after breakfast about twice a year, has never been above 60 mg. per 100 ml. No doubt if he undertook real exertion he would be found in a state of collapse if not in convulsions.

The rapid recovery after taking sugar is almost diagnostic. I am sure it was the operative ingredient in Dr. Parkes Weber's stimulating drink.

Hove, Sussex. G. M. WAUCHOPE.

IN ENGLAND NOW AND AGAIN

SIR,—Your issue of Sept. 28 without your Peripatetic Correspondence was like a bog without a snipe.

Ballyclough, Ballysheedy,
co. Limerick. M. J. G. FURNELL.

ARTERIOSCLEROSIS AND HÆMOPHILIA

SIR,—The occurrence of widespread arteriosclerotic lesions in a hæmophilic patient reported in your journal by Dr. Stewart and Dr. Acheson [1] has aroused great interest, since it is generally assumed to be contradictory to the rôle attributed by Duguid [2] to mural thrombi in the pathogenesis of arteriosclerosis. However, if the dynamic balance between fibrin deposition and fibrinolysis forms the basis of Duguid's observations, as suggested by us,[3] it is easy to explain the occurrence of arteriosclerotic processes also in patients with hæmophilia. Since this problem has been repeatedly presented to me after the appearance of Stewart and Acheson's paper, the following considerations might be of interest.

When tissue destruction followed by bleeding occurs in a normal person the extravasation of blood is soon stopped by the effect of an undisturbed hæmostatic mechanism, which acts through an intermediate activation of the plasma-thromboplastin system and also by the direct effect of the thromboplastin released from the injured tissue.

When the process of coagulation is uncomplicated (which includes the absence of inhibitory substances or of fibrinolytic agents), the numerous minute injuries normally occurring during daily life produce no excessive bleeding but rapidly heal. We have demonstrated that local hæmostasis is so effective even at low prothrombin-proconvertin levels (10% P.-P. concentration) that surgery can be performed safely during dicoumarol treatment, provided the treatment is under rigid control.[4] Though clotting-times are greatly prolonged in these cases, the local hæmostasis based on the release of thromboplastin from the injured tissue, and aided by formation of plasma-thromboplastin, is sufficient to prevent hæmorrhage.

In hæmophilia, prolongation of the clotting-time is caused solely by a defect in an activation system involved in the formation of plasma-thromboplastin. Since tissue-thromboplastin acts directly on the prothrombin system, this local reaction proceeds as well in hæmophiliacs as in normal persons. The frequent and often long periods of remission seen in some patients with hæmophilioid disorders, especially in those of lower degrees of severity, are probably chiefly caused by the local effectiveness of the tissue-thromboplastin in preventing hæmorrhage from minute injuries. In this respect it is interesting to note that Stewart and Acheson's patient was very old (73) for a hæmophilic patient. The defective plasma-thromboplastin system prevents normal clot formation in these patients at sites where the amount of thromboplastin released from the tissue is too small (e.g., in wounds, during profuse bleeding, &c.).

We have recently found that the central layers (intima and media) of the human aorta have a very high thromboplastic activity with no or a very low fibrinolytic activity.[5] Therefore, the local deposition of fibrin on the walls of the arteries caused by the tissue-thromboplastin present at an injured intimal surface would not be expected to differ significantly between normal and hæmophilic

1 Hunter, R. B., Shepherd, D. M. *Brit. med. bull.* 1955, **2**, 50.
2 Robb-Smith, A. H. T. *Ibid*, p. 70.
3 Tawfic, A. *Lancet*, 1955, ii, 984.
4 Jaques, L. B., Waters, E. T. *J. Physiol.* 1941, **99**, 454.
5 Lyburn, E. F. St. J. *Ibid*, 1956, **134**, 207.

1. Stewart, J. W., Acheson, E. D. *Lancet*, 1957, i, 1121.
2. Duguid, J. B. *Brit. med. Bull.* 1955, ii, 36.
3. Astrup, T. *Lancet*, 1956, ii, 565.
4. Astrup, T., Müllertz, S. *Schweiz med. Wschr.* 1954, **84**, 815. Müllertz, S., Storm, O. *Circulation*, 1954, **10**, 213. Storm, O., Tybjaerg Hansen, A. *Ibid*, 1955, **12**, 981.
5. Astrup, T., Claassen, M. 6th European Congress of Hæmatology, Copenhagen, 1957. Abstract, p. 101.

persons. There is thus no reason to assume that the mechanism of arteriosclerosis as suggested by Duguid (on the basis of histological sections) and supported and extended by us (on the basis of the dynamic balance between blood coagulation and fibrinolysis) should not be almost as effective in hæmophilic as in normal persons.

It could further be argued that the defective plasma-thromboplastin system in hæmophilia could, by prolongation of the local extravasation of blood (as mentioned above), produce at certain places a larger coagulum which would be difficult to remove and which therefore could form after organisation as the end-result an increased amount of new connective tissue.[6] Actually this sequence of events is seen in the crippling of joints after hæmarthrosis in hæmophilic patients.

This again emphasises the significance of tissue-thromboplastin for local hæmostasis (also in hæmophiliacs). An important consequence of this consideration is that the disseminated formation of small fibrin deposits can be hampered by a decrease in the latent activity of the prothrombin system only (such as by anticoagulant treatment with dicoumarol). A decrease in the activity of the plasma-thromboplastin system (as in hæmophilia) is ineffective, since it does not influence the effect of the tissue-thromboplastin locally released after tissue injury.

Copenhagen. TAGE ASTRUP.

CARS, DRIVERS, AND CRIMINALS

SIR,—You remark in your leading article of Sept. 28 "a man drives as he lives." One of us has for six years been noting whether or not criminals referred for psychiatric examination are drivers of motor vehicles and whether they have had accidents or convictions for speeding or for dangerous driving. The inquiry was started because it was noted that certain offenders, especially those convicted of indecent exposure, seemed to be compensating for their frustration and inadequacy through driving powerful motor vehicles. Study shows, however, that, in the indecent exposers, disastrous results are less frequent than in some other categories of offenders; possibly, because of their other personality qualities, their driving habits are more easily noticed and more freely talked about.

Of the last 188 convicted male criminals, over 21 years of age, seen in this way, 102 (54%) were drivers. The sample of drivers was made up, according to their last offence, as follows:

	No. of convicted persons	*Professional drivers*	*Previous traffic offence or accident*
Indecent exposure ..	21	6	2 (*9·5%*)
Homosexuals	26	3	6 (*23%*)
Indecent assault on female	21	2	2 (*9·5%*)
Acquisitive offenders ..	34	2	8 (*23%*)
Driving offenders ..	3	0	3 (*100%*)

Excluding the three driving offenders, 16% of this mixed group had previously had accidents or convictions for dangerous driving. It would therefore seem that at least those criminals seen by a psychiatrist do not generally drive as they live but that antisocial tendencies are directed into channels peculiar to the individuals rather than expressing themselves in all that they do. One or two examples might illustrate the point:

Male, aged 26, 10 years' history of crime, including larceny, possession of firearms, assault upon policeman, unlawful possession, indecent assault on boy. He is a regular driver, but has no traffic offences other than two parking offences and has never had an accident.

Male, aged 32. Homosexual offences. His hobby is motor-cycling. He finally "borrowed" a motor-cycle and was charged with "taking and driving." He has never had an accident nor been charged with a traffic offence.

Contrary to reports from other countries, the inexperienced and excited 15- and 16-year-olds who drive other people's motor vehicles away rarely crash them. Of 43 such youths seen consecutively, 1 crashed his vehicle and 1 drove dangerously. Many of them, after a joy ride with their friends, park the vehicle and use it again the following evening, often travelling long distances. Rather than driving as they live, some hesitant and inferior-feeling people, as soon as they have control of a motor-car, become confident and competent.

These facts do not in any way disprove Tillman and Hobbs's assertion[1] that traffic violators have police records much more frequently than those within the low-accident group. The reverse, however (that those with police records are much more frequently traffic violators), even with repeated offenders and with those of highly antisocial personality, is not true with these samples.

Maudsley Hospital, London, S.E.5. P. D. SCOTT
FREDA GRAINGER.

THE WOLFENDEN REPORT

SIR,—As a layman not suffering from a disability acquired at the coal-face of psychiatry, or for that matter at the coal-face of general practice, may I comment on the views of Dr. Learoyd (Sept. 14) and Dr. Webster (Sept. 28).

The validity of Dr. Webster's analogy depends on whether homosexuality is a disease. Unfortunately there is no reliable indication of the incidence of homosexuality in this country; but the figures of the Kinsey report suggest that in the United States half the population are exclusively heterosexual, 4% exclusively homosexual, and almost half (46%) have some heterosexual *and* homosexual contacts or reactions during their adult lives. It appears that there are as many diseased as healthy cells in the body of society!

Unfortunately some people ignore the variability that exists in any animal population, preferring to label as sinful, diseased, or abnormal, anyone who in any way differs from themselves, such as Negroes, Jews, or homosexuals. As Dr. Webster so rightly says "The rights of the community are the sum of its individual members . . .", whether they be heterosexuals, homosexuals, or individuals who engage in both forms of sexuality.

London. JOHN NOBLE.

"PNEUMOCONIOTIC NEUROSIS"

SIR,—I think Dr. Macdonald's letter of Sept. 28 rather tends to run to extremes. On the basis of a single morning's discussion at an industrial medical meeting he claims that miners as a whole with pneumoconiosis are dealt with very ineffectively by the pneumoconiosis panels throughout the country. I have a little experience of our local panel, and I can say that it is their practice in each case to regard the X-ray findings as only part of the complete clinical picture; not only does each patient have a full clinical examination but an exercise-tolerance test is also carried out. I am not suggesting that the present system worked by the boards is by any means ideal, and no doubt proportional discrepancies exist in the claims they assess; but within the margin of human error the present system seems to have been the best devised, and I am sure that it would be very difficult for anyone to provide a superior working alternative.

Dr. Macdonald ignores the fact that severe respiratory disablement in coalminers is more often the result of chronic bronchitis and emphysema, and also the fact that pneumoconiosis of itself does not cause severe respiratory disablement until it has reached a comparatively late stage. In my own area alone there are 240 pneumoconiotics and only 7 of these are not working because of their disease or the combined effects of it and old age. The others find it possible to work in "approved

6. Astrup, T. *In* Goslings van Swaay's Contemporary Rheumatology. Amsterdam, 1956; p. 124.

1. Tillman, W. A., Hobbs, G. E. *Amer. J. Psychiat.* 1949, **106**, 321

dust-free conditions," at jobs of varying severity, some underground. These people do so of their own free will and are regularly followed up by the local panel. In my experience, their percentage disability remains static, but in some few cases it does increase.

Dr. Macdonald seems to have been overimpressed by the few dissatisfied people who, having worked down pits for many years, go to their local panel expecting compensation for a disability which is the result of either advancing years or maybe neoplasm. In the first case it may be difficult to explain to the patient just exactly why he has become breathless and in the second place it may be even inadvisable on the grounds of humanity, hence he comes away mentally unsatisfied and feels that he has had a raw deal.

Has Dr. Macdonald a better cure to put forward for these supposed social injustices other than another commission? We all know from recent experience that these bodies are apt to arrive at extraordinary conclusions and that no Government or Government department is bound to act upon their findings.

Barnsley. J. D. M. HOLT.

TRANSPORTING SHOCKED PATIENTS

SIR,—The transport of shocked patients from the operating-theatre to the ward can be a serious matter, especially if the distance is long; even when patients have been kept in a recovery room for some hours their condition has often deteriorated from jolting during the journey.

Much is to be gained by putting such patients into their bed in the operating-theatre. The surgeon and

Fig. 1—The cradle.

anæsthetist can then approve the position, oxygen administration, &c.; but beds were not designed to be moved out of a ward and are unsuitable for taking such patients down long corridors, however desirable this might be. Figs. 1 and 2 show a cradle originally designed for Royal Naval hospitals over twenty-five years ago. It is slipped under the bed, and when the handle is turned the whole bed rises on two pneumatic wheels. In this way we find that seriously ill patients can be transported without harm to distant parts of the hospital.

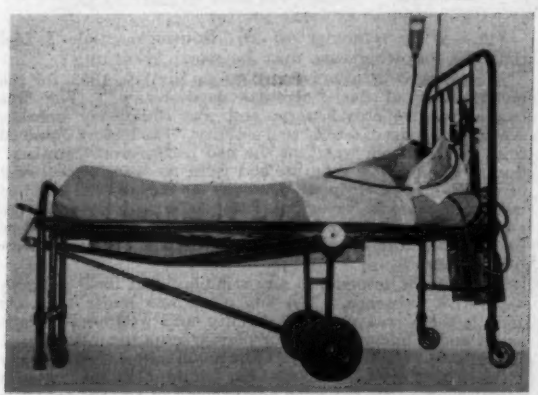

Fig. 2—Resting on two pneumatic wheels, the patient is in bed complete with transfusion-stand and, behind the bed, a bracket for oxygen-cylinder and two drain bottles.

The cradle was designed and made by Blake & Son, Gosport, Hants.

Southsea, Hants. H. B. C. SANDIFORD.

MEGALOBLASTIC ANÆMIA DURING ANTICONVULSANT THERAPY

SIR,—Since Badenoch's original communication,[1] this interesting complication has often been recorded; but unfortunately not all reports have been strictly confined to megaloblastic anæmia (that is, proven by bone-marrow examination). Some have included macrocytic anæmias, which, though interesting, have rather tended to confuse the picture.

To avoid future misunderstandings, especially between true megaloblastic and macrocytic anæmias, it is considered justifiable to report 2 further cases found in hospital records, and to make some personal observations, so that the condition may be more widely recognised, and future cases more accurately investigated and carefully treated.

CASE 1.—A male epileptic patient, now aged 36, was admitted to Banstead Hospital under certificate in 1941. He was confused, disoriented, and retarded without insight and initiative, and was thought to have an "epileptic psychosis."

Fits had begun some eight years previously. He continued to have frequent major and minor seizures, poorly controlled by phenobarbitone gr. 1 t.d.s.; phenytoin sodium, gr. $1^1/_2$ t.d.s., was given in addition in January, 1949, and led to a substantial reduction in the numbers of both types of fit.

On Sept. 13, 1953, he was noticed to be lethargic, and two days later faucial inflammation and a temperature of 101·4°F developed. Apart from generalised cutaneous and mucosal pallor no other physical signs were detected, and he had no complaints. No history was elicited of nutritional deficiency, diarrhœa, or gastro-intestinal disturbance.

On Sept. 23, blood investigation showed hæmoglobin 20%, red cells 1,000,000 per c.mm., colour-index 1·0, total white cells 3000 per c.mm. with normal differential count. The stained film showed gross anisocytosis and poikilocytosis. Two days later the marrow was reported to be megaloblastic and consistent with a diagnosis of pernicious anæmia. The erythrocyte diameter was 8·4 μ and megaloblasts constituted 30% of the pre-erythrocyte series. Other investigations, including liver-function tests, gave normal results.

On Sept. 25 two pints of packed cells was transfused, and the hæmoglobin three days later was 35%. Stained films still showed obvious anisocytosis, and reticulocytes were 0·5%.

On Oct. 16 folic acid 20 mg. daily orally was begun. This was continued until August, 1954, though blood-counts had returned to normal by December, 1953. Throughout the whole of this period the anticonvulsants were continued, and he has remained well since.

Recently a histamine-test meal revealed normal free and total acidity. A barium-meal examination and follow-through showed no lesion in the gastro-intestinal tract, but unfortunately the patient was not sufficiently coöperative for fat-balance to be studied.

CASE 2.—A female high-grade mental defective, now aged 35, was admitted to the Manor Hospital, Epsom, in May, 1951. Epileptic fits, mainly minor, had begun two years earlier. A routine physical examination on admission was negative, except that the ankle reflexes were not elicited.

She was given phenobarbitone gr. 1 b.d. from November, 1951, and phenytoin sodium was added in January, 1954—gr. $1^1/_2$ midday initially, increased to gr. $1^1/_2$ b.d. in October, 1955. This medication was continued throughout.

On March 23, 1956, she did not look well and refused her meals. She was pale, except for her cheeks, and had a smooth tongue. Apart from this, physical examination was negative, except that no deep reflexes could be obtained in either the arms or legs.

On March 27 her hæmoglobin was 45%, red cells 1,690,000 per c.mm., mean corpuscular hæmoglobin 39 γγ, and total

1. Badenoch, J. *Proc. R. Soc. Med.* 1954, 47, 426.

white cells 4200 per c.mm. with normal differential count. The stained film showed moderate anisocytosis and poikilocytosis. Reticulocytes were 0·2%.

On March 29 the bone-marrow was reported as being largely megaloblastic and typical of a deficiency of anti-pernicious-anæmia factor. She was given folic acid 10 mg. daily and injections of vitamin B_{12} 50 µg. weekly from March 29. She made a rapid clinical recovery, and by April 5 her hæmoglobin had risen to 62%, with a reticulocyte response of 14·6%.

Folic-acid treatment was stopped on April 13, but the vitamin-B_{12} injections were continued until October, 1956, though the blood-count had returned to normal by the end of April.

It is surprising that the fact that both patients remained well after folic acid and vitamin-B_{12} therapy had been stopped did not lead to a revision of the original diagnosis. This seems to suggest a general lack of recognition of this important complication of anticonvulsant therapy, which may well prove more common than is at present realised.

It is very unlikely that other factors than anticonvulsants were responsible for the anæmias in these two patients, but the possibility must always be borne in mind in any retrospective study of this kind. Case 1 seems a fairly straightforward example of folic-acid deficiency, though why folic-acid treatment was delayed for a month is not clear. In case 2, as vitamin B_{12} and folic acid were both given, the deficient factor cannot be determined.

Altogether some 19 examples have been reported in the British literature. Recently Volterra and Romualdi described a further case from Italy, and possibly the first from the continent.[2] In addition Hobson et al.[3] reported a case of megaloblastic anæmia in a patient taking large quantities of the double barbiturate 'Tuinal' containing amylobarbitone sodium and quinalbarbitone sodium.

Benians and Hunter[4] have tried to estimate the incidence of megaloblastic anæmia due to anticonvulsant and sedative treatment in a mental hospital population of over 2000 patients, by searching laboratory records for all blood-films showing evidence of macrocytic anæmia. Over a four-year period they found 23 such patients, but in only 3 were the anæmias thought to be due to anticonvulsants and sedatives alone, since in most cases additional factors were present. In none of the 3 was megaloblastic reversion of the bone-marrow actually reported. In any hospital practice macrocytic anæmias are fairly common, but many are not megaloblastic—e.g., those due to liver disease or marrow hypoplasia. I have often noticed macrocytosis in routine blood-counts in epileptic patients, but cannot say whether this is due to epilepsy or drug therapy. Megaloblastic anæmias resulting from anticonvulsant therapy may be commoner than Benians and Hunter[4] suggest, because cases are missed or misdiagnosed, as in the present two examples.

There has been interesting speculation as to why these anæmias develop. Hawkins and Meynell[5] suggested that phenytoin sodium could act as a folic-acid antagonist, but this leaves unexplained those cases that respond to injections of vitamin B_{12}.[1,6] Similar megaloblastic anæmias have been reported following the administration of primidone, alone[7] or with phenobarbitone.[8] It has been suggested that barbiturates, phenytoin, and primidone, which are closely related structurally, may in certain circumstances interfere with enzyme systems normally incorporating folic acid as a co-factor.

What these particular circumstances are and how they operate is not at present clear; the anæmia can develop suddenly and severely after a variable period of drug ingestion. Why some patients relapse after hæmatinics are discontinued[9] and others remain well has not yet been satisfactorily explained.

Banstead Hospital,
Sutton, Surrey. J. C. BARKER.

2. Volterra, M., Romualdi, G. *Brit. med. J.* Aug. 17, 1957, p. 412.
3. Hobson, Q. J. G., Selwyn, J. G., Mollin, D. L. *Lancet*, 1956, p. 1079.
4. Benians, R. C., Hunter, R. A. *J. ment. Sci.* 1957, **103**, 606.
5. Hawkins, C. F., Meynell, M. J. *Lancet*, 1954, ii, 737.
6. Webster, J. M. *Ibid*, p. 1017.
7. Fuld, H., Moorhouse, E. H. *Brit. med. J.* 1956, i, 1021.
8. Girdwood, R. H., Lenman, J. A. R. *Ibid*, p. 146.

FAINTING AND CEREBRAL DAMAGE

SIR,—Dr. Bourne's article of Sept. 14 draws attention to many disquieting facts

First, some of the cases described would seem to be extremely unsuitable subjects for a nitrous-oxide anæsthetic, whether sitting or lying. The healthy miner of 46, coming off a heavy night-shift, presumably fasting, would not appeal to me as a suitable subject for gas; especially when it was intended to remove *twenty-five* teeth at one sitting. Any dentist who undertakes to act as his own anæsthetist and to extract so many teeth, with no assistance other than that of a female receptionist, is running a very grave risk of disaster. Similarly, trying to give gas to presumably unpremedicated naval boxers is a very certain way of having one's surgery wrecked.

Secondly, external cardiac massage is mentioned twice. This is surely not meant to be taken as a serious attempt at resuscitation, or is it only likely to be effective when smelling-salts are inhaled at the same time?

Thirdly, the appalling lack of post-anæsthetic recovery-rooms is indicated by such expressions as "We had to half carry him downstairs to get him into a taxi . . ." and "Several dentists who sent patients away *in stupor* . . ." Only too familiar is the dental suite consisting of waiting-room and surgery, where the only place to recover from the anæsthetic is in the dental chair. The unfortunate patient may not return to the waiting-room for fear of upsetting the patients awaiting their turn there, and often leaves for home in a state not far removed from syncope. Has it been noticed, too, how frequently such dental suites are at the top of a flight of stairs?

Dr. Bourne promises us that case-histories and other data will be published in full later. If they draw the profession's attention to the potential dangers of a "whiff of gas" in the dentist's chair they will have indeed performed a useful service.

North Middlesex Hospital,
London, N.18. G. S. A. KNOWLES.

SIR,—Dr. Bedford (Sept. 14) postulates an idiosyncrasy to anoxia as a cause of the (mercifully rare) torpid vegetative state of post-shock dementia.

Our forebears might have said it was due to keeping the body alive after the spirit had left it, and who knows that they might not have been right?

It is to be hoped that this condition will, indeed, become rarer-or geriatric medicine will be known as the science of preventing old people from ending their lives naturally!

Stanhope, Bideford,
N. Devon. S. C. WAKE.

SIR,—With reference to Dr. Bourne's article I feel that the following case may be worth recording:

A lady, aged 57, was referred to me in May, 1952, for the investigation of her "cerebral degeneration." She was unable to give any history, and was completely aphasic, showing no signs of intellectual activity. The history obtained from her husband, was that she had had several "strokes" during the last few months, and from the neurological unit of the Middlesex Hospital, London, we learned that she had been seen there in November, 1951, suffering from attacks of confusion for some weeks, followed by gross impairment of memory. The diagnosis from that hospital was organic disease of the brain.

She did not respond to any stimulus, and lived a purely vegetative existence. The left pupil was larger than the right; there was cogwheel rigidity and weakness in both arms, and a bilateral extensor plantar response. Her blood-pressure was slightly raised (170/110 mm. Hg), there were no gross signs of arteriosclerosis of her fundi. X-ray examination of the chest suggested some enlargement of the left ventricle.

9. Chalmers, J. N. M., Boheimer, K. *Lancet*, 1954, ii, 920.

The electrocardiogram showed sinus rhythm and left axis deviation, but no other great abnormality. During her stay in hospital, the patient appeared to have two attacks of unconsciousness, from the second of which, on June 12, 1952, she did not recover.

Post-mortem examination showed only slight enlargement of the heart, and normal heart-valves and myocardium. A large cauliflower type of growth $2^1/_2 \times 1 \times 1$ in. was attached to the posterior wall of the left auricle. This did not extend into the pulmonary veins, nor through the mitral valve, but was folded up in the auricle. In the brain multiple areas of softening affected both cerebral hemispheres, basal ganglia, and left cerebellar hemisphere. There were slight congestive changes in the liver, which showed a nutmeg pattern. To obtain a more complete examination of the heart the whole organ was sent to the Lewisham Group Laboratory, and we owe the following report to the kindness of Dr. M. O. Skelton:

"The heart weighs 417 g., is enlarged and the left ventricle measures, on average, about 20 mm. in thickness, the right ventricle about 5–6 mm. in thickness. In the left auricle is a large polypoid mass of soft, slightly gelatinous tissue measuring 4 cm. long and of an average diameter of about 3 cm. This polypoid mass is attached to the endocardial surface of the septum about 2 cm. posterior to the foramen ovale. A second very minute mass of similar appearance 5 mm. in length is attached to the posterior wall of the left ventricle, medial to the attachment of the posterior papillary muscle of the mitral valve. The myocardium of the left ventricle shows several semitranslucent greyish areas of scar tissue.

"Histologically . . . the whole appearance [of the mass in the left ventricle] is that of the classical so-called 'myxoma' of heart. The small nodule from the left ventricle has an identical appearance microscopically. The myocardium shows much fibrin replacement by scars and old infarcts, and some small coronary twigs contain what appears to be embolic fragments of the main auricular mass."

Histological examination of the kidneys showed "small masses of presumably embolic tissue in some small intrarenal arteries; in one small artery small collections of oval cells of the myxoma are seen deep in the elastica of a vessel, conceivably due to invasion. Sections of the brain show small, presumably embolic, masses in the meningeal and cerebral vessels."

Although in this case, the extreme dementia was obviously caused by multiple embolisation of cerebral blood-vessels, it may be of some interest in the differential diagnosis of states of extreme dementia developing suddenly.

Joyce Green Hospital, Dartford. JACOB GOLDSTEIN.

REFLECTIONS ON MEDICAL TRAVEL

SIR,—Professor Witts's article [1] was most interesting. He points out the difficulty of the seconding of British medical staff to work abroad for two years because of the understandable fear of the loss of promotion during an absence.

There are perhaps two groups of doctors who could conveniently consider a short term of work abroad. The first are those who have chosen a hospital specialty and are in a senior house-officer post; they might like to do a spell abroad before seeking a registrarship. The others are future general practitioners who have held hospital appointments in those subjects which interest them, and would like a tour abroad before settling down in general practice.

In addition to the short-term appointments offered in the Overseas Civil Service and by governments abroad, there are the missionary societies who are usually willing to consider short-term offers of service.

The letter from "Expatriate" (July 13) quite rightly points out the need for "men and women who would serve for five to ten years not just as advisers but as working practitioners." A Westerner working in a foreign hospital alongside foreign doctors (with an interpreter as necessary) has a hard but rewarding time. If only more would come for two or three years, there would be those among them who would learn the language and stay for the five or ten years that "Expatriate" commends.

One good way of helping underdeveloped countries is the arrangement of exchanges between their medical schools and Western medical schools. The University of Minnesota has done excellent work in this way for the medical school of Seoul National University, which is now producing well-trained graduates. It would be a great contribution to medical education abroad, and hence to the alleviation of suffering, if British medical schools could each have a link with a school abroad and exchange staffs and so raise standards.

Undoubtedly the best way for a doctor to learn modern medicine is to go to a good centre. But only a minority of doctors in underdeveloped countries can do this. Those who cannot go abroad are greatly helped if Western doctors come out to their countries to work with them as colleagues. Apart from the actual work and teaching he does, a visiting doctor has a catalytic action which stimulates the local staff to show what they can do, and improvements result. Wisdom and patience are needed in conditions that are often trying, but the gratitude of the patients and the friendships developed with foreign colleagues make a tour of service abroad abundantly worth while.

Friends Service Unit,
Kunsan,
Cholla Pukto,
Korea. J. G. BANCROFT.

1. Witts, L. J. *Lancet*, 1957, i, 1291, 1343.

INFLUENZA

SIR,—It was with great pleasure that I read the letter of Sir John McNee in your issue of Oct. 5, and I should like to support the plea of a former colleague in France for a more routine search for *Hæmophilus influenzæ*. Long after the 1918 pandemic, my laboratory staff was able to find this organism more frequently by the use of Fildes medium, which is most valuable for this purpose—since this infection was often missed before this medium became used as a routine in the investigation of nose and throat swabs.

Sir John's letter has stimulated me to record what has been passing through my mind for a considerable time. In our joint work, with the help of Brunt, on trench fever in the 1914–18 war, we ascertained that the infective agent of trench fever was attached to the red blood-cell. I believe that the virus of influenza, if it is not actually attached to the red blood-cell, has a definite toxic effect on the hæmoglobin of the cell and interferes in this way with its oxygen-carrying capacity; and that much of the fatigue following influenza is due to the resulting diminished oxygenation of tissues. In this respect I have often noted that a single injection of vitamin B_{12} given after the temperature has subsided will, within 3 or 4 days, coincide with or result in very great improvement in the physical fitness of such patients. This is due presumably, to the production of fresh red blood-cells free from this toxic effect; so that the tissues again become more completely oxygenated. The routine use of vitamin B_{12} following influenza might greatly hasten return to work after influenza.

Whilst the infective agents of trench fever and influenza are, of course, different, there is a great similarity between the two diseases in the abruptness of the attack. During the 1914–18 war, some of the trench-fever cases became suddenly unconscious, and were transferred to hospital as suspected epidemic cerebrospinal meningitis, but nothing abnormal was found in the cerebrospinal fluid. The patients soon recovered consciousness, and the "clear-fluid" cases later followed the typical course of trench fever. In the present influenza outbreak some patients are struck down with a somewhat similar vicious

onset with severe physical exhaustion. Some toxic effect on the red cells might conceivably cause this prostration, and the virus may "hatch out" from the red cells in a similar way.

Manchester. ARNOLD RENSHAW.

Obituary

EDGAR LEIGH COLLIS

C.B.E., M.A., D.M. Oxon, M.R.C.P.

Dr. E. L. Collis, emeritus professor of preventive medicine in the University of Wales, died on Oct. 1 at the age of 86.

He was educated at Stourbridge Grammar School and at Keble College, Oxford. At Oxford he gained a first class in the natural science school; he was also president of the Oxford Swimming Club, rowed in his college eight, and ran for Oxford in the university sports in 1892 and 1893, in the latter year tying for first place in the hurdles.

He qualified from St. Thomas's Hospital in 1896, and the following year he started his medical career as a general practitioner in Stourbridge. In the ten years which he spent there he obtained the knowledge of home environment in relation to the patient which is essential to all doctors in any branch of the profession. He was keenly interested in the advancement of industrial medicine, and in 1908 he became one of H.M. medical inspectors at the Home Office. He remained there till 1917 when he took over the work of director of welfare and health in the Ministry of Munitions for two years. In 1919 he was appointed to the Talbot chair of preventive medicine in the Welsh National School of Medicine at Cardiff.

While holding these posts he became more and more engrossed in the study of disease in relation to working environment, and although his interests were wide his work, after his appointment to his chair, rather naturally became focused on the South Wales mining industry. He studied pneumoconiosis in all its facets and worked with J. S. Haldane, E. H. Kettle, and other investigators in this country and abroad. He delivered the Milroy lecture to the Royal College of Physicians of London in 1916, choosing as his subject occupational pneumoconiosis with special reference to dust phthisis.

Before the Ministry of Fuel and Power appointed a medical inspector of its own in 1927, the Minister was advised by a committee who were responsible for assessing the influence on health of working conditions in coalmines, metalliferous mines, and quarries. Evidence of Dr. Collis's work as a member of this is to be found in three reports of the miners' nystagmus committee of the Medical Research Council (1922, 1923, and 1932) and in the M.R.C. report (1924), which he wrote, with Dr. T. L. Llewellyn, on miners' beat knee, beat hand, and beat elbow.

His influence was by no means confined to the medical side of his interests. His work on the National Miners' Welfare Joint Council was far-reaching. Pithead baths, canteens, recreation schemes, scholarship schemes, and a long list of other benefits owe their origin in large part to him. Outstanding, too, was the share he took in the establishment of a rehabilitation service for miners. In 1942 the Miners' Welfare Commission, at the request of the Ministry of Fuel and Power, agreed to accept responsibility for the organisation of centres in various parts of Great Britain for the rehabilitation of injured miners. Dr. Collis undertook the delicate task of advising as to the chairman and, later, the appointment of orthopædic surgeons to carry out this project. These successful centres were the first of their kind in this or any other country, and they were later transferred to the National Health Service.

He retired in 1933 to Lossiemouth where he had long had a house. In 1937 he was appointed C.B.E. In 1953, in recognition of his work in occupational health, the Society of Apothecaries of London conferred on him the diploma in industrial health, honoris causâ—a gesture which gave him much pleasure.

S. W. F. writes:

Dr. Collis was witty, incisive, enthusiastic, a man of splendid physical and mental health. His wife, who survives him, was his constant and beloved companion. In 1953 he wrote in a private letter: "Life's well worth living. Gardening is good. I hope to gather a ripe strawberry on Christmas Day." In December last year he again wrote: "We still progress, 84 and 86, with some ageing inconveniences of getting about and in seeing. However, I work our typewriter."

And now a fine, vigorously active life has ended. Its influence for the good of those employed in many industries will survive. His first thought was not what would please the administrators but what would be best for the industry—true to the motto of his crest *Finem respice*.

JEAN NICOLESCU

M.D. Bucharest

Prof. Jean Nicolescu, who held the chair of histology in the University of Bucharest for many years, died on Sept. 6 at the age of 62.

W. H. McM. writes:

We first met him just a year ago on a Saturday afternoon. A big-hearted man, good humoured and welcoming, he bade us first pay attention to the treasures in his well-polished bookcases. One by one he brought them down, fondling them as he did so, and demonstrated their bindings, the quality of the paper and printing, and the value of their texts. Nearly all were pre-war and it was clear that many of them recalled to him the happy postgraduate years he spent in Paris with Pierre Marie and Charles Foix.

After the books there was the tour of the department when we learned how they coped with the enormous influx of medical students. Then came the page proof of *Morfopatologia sistemului nervos*, a system of neuropathology by Rumanian authors, of which he was editor. The magnificent coloured drawings gladdened his artistic heart and as he delved in the package in search of his favourites, he expressed his feelings with a variety of French superlatives. It is not possible to turn the pages of this textbook (published this year) without recalling his pleasure and pride in its compilation. Finally his pupils were permitted to show us the photomicrographs of his atlas on visceral nerve-endings, which will be his last of many important contributions to medical science, while he watched approvingly in the background.

To meet Nicolescu and hear him reminisce was a memorable experience, for he had a distinguished presence, a cultured mind, and real charm. His face was expressive and sensitive, and his sudden smile completely disarming: he could be almost expansive, yet at all times he was modest and even bashful. Only a few weeks ago he was in Brussels for the first International Congress of Neurological Sciences and there he sought out his many friends from the West and was overjoyed to meet them again.

Births, Marriages, and Deaths

BIRTHS

MASSEY.—On Oct. 2, in Selly Oak Hospital, Birmingham, to Fay (née Waldron) and Dr. Paul Massey—a daughter, Fiona Jean Orgill.

Appointments

BREWERTON, D. A., M.D., B.SC McGill, M.R.C.P., D.PHYS. MED.: consultant physician in physical medicine, Royal National Orthopædic Hospital, London.

BURNS, CARL, M.B. Manc., D.C.H., D.P.H.: school M.O. and M.O.H., Brownhills, Staffordshire.

HOPEWELL, J. P., M.B. Lond., F.R.C.S.: assistant surgeon (consultant), Royal Free Hospital, London.

JAMIESON, CHRISTINE J. T., M.B.: assistant M.O.H., West Lothian.

JONES, B., M.B., D.P.H.: assistant M.O., Luton.

NEYLON, J. P., M.B. N.U.I., D.C.H., D.P.H.: M.O.H. and school M.O., Bilston.

OWEN, KENNETH, M.S. Lond., F.R.C.S.: part-time consultant in general surgery, St. Mary's Hospital, London.

* SMITH, IRVINE, M.B. Camb., F.R.C.S.: part-time consultant surgeon, Burton on Trent group of hospitals.

WATT, GEORGE, M.B.E., M.B. Edin., D.T.M. & H.: deputy group medical superintendent, Aberdeen General Hospitals.

Hertfordshire County Council:

BIRCH, E. W. G., M.B. Lond., D.P.H.: deputy M.O.H., Watford.

O'REILLY, P. B. M., M.R.C.S., D.P.H.: assistant county M.O.

YATES, JOYCE O., M.B. Birm., D.C.H.: assistant county M.O.

South-East Metropolitan Regional Hospital Board:

LAUDER, J. R., M.R.C.S.: deputy senior M.O.

MILLER, W. B. D., M.B. Glasg.: assistant senior M.O.

* Amended notice.

Notes and News

DOCTORS AND NATIONAL SERVICE

THE problems of redistribution and resettlement which the medical profession is likely to face when National Service ends in 1960 were discussed on Oct. 7 by Mr. H. E. Harding in his report as dean of the Westminster Medical School.[1] The Waverley report, he pointed out, had made clear the large number of National Service doctors who are employed in the medical branches of the Services, especially the Army and the Air Force, and it seemed likely that over a two-year period over 1000 young doctors would be released from the Services. He could not find any responsible body had yet concerned itself about finding them jobs in civilian life and he shared the concern of these young men about their future. "They represent," he said, "an enormous potential of medical skill and the problem of their future employment can only be determined by national policy after careful inquiry. The National Health Service in its existing establishment, budgeting, and planning has given no assurance that the problem is any less than I have postulated."

FIRST-AID TREATMENT OF BURNS

A BOOKLET compiled for use in the Royal Air Force[2] deals in a practical way with the treatment of burns and or scalds from the moment they are sustained to the time the patient is handed over to a special centre, if this proves necessary. It is especially valuable in focusing attention on the initial phases when the foundation can be laid for a successful end-result, or the chance of such a result jeopardised by careless or casual handling. Although part of the booklet may seem unnecessary to a civilian reader, the whole of it can be recommended for its interest and readability. As is wisely said in the foreword: "We cannot wait for the last word in ideas, any more than in concrete devices"; but even if this brief work does not present the last word, it presents some very wise ones. It should be available for works' first-aid posts, hospital casualty departments, practitioners' surgeries, and (dare one suggest it?) medical-inspection rooms and sick-bays in the other two Services.

A CARDIOLOGICAL CENTENARY

A HUNDRED years ago The National Hospital for Diseases of the Heart began its career in London at 67, Margaret Street, Marylebone. Its founder and the only member of its medical staff in its early days was Dr. Eldridge Spratt, an aggressive character whose eccentricities often seemed to pass the bounds of roguery. But despite a burden of debts and other troubles, largely attributable to Dr. Spratt's peculiarities, the hospital took root and gradually earned a wide reputation as a vigorous centre for the advancement of cardiology. Today, the hospital stands in Westmoreland Street, Marylebone, and it has an associated Institute of Cardiology and a branch in Buckinghamshire. As Sir Harold Boldero remarked at a centenary dinner at Apothecaries' Hall on Oct. 2, it would not be an overstatement to say that the National Heart Hospital was now the foremost cardiological hospital in the world. It has certainly come to the fore in a way which would have seemed very improbable in the uneasy time of Dr. Spratt.

For the past 45 years the hospital has been fortunate to have as its secretary an indefatigable and zealous administrator, Captain Robert Whitney. At the dinner Mr. J. M. Oakey, chairman of the hospital's board of governors, spoke enthusiastically of Captain Whitney's share in the hospital's achievements, and a presentation was made to record the hospital's congratulations and thanks to its secretary since 1912.

The guest of honour, Mr. Iain Macleod, Minister of Labour and National Service, recalled a visit he paid as Minister of Health to the National Heart Hospital in November, 1952. Of the scores of hospitals he had visited, nowhere had he seen such brilliant work being done, and in hideously overcrowded conditions. Mr. Macleod hoped that improvements would soon be possible and he looked forward especially to the early provision of surgical beds linked with the work of the hospital. Sir William Arbuthnot Lane, vice-chairman of the hospital board, proposed the toast of the medical, administrative, nursing, and technical staffs, and in his reply Dr. Maurice Campbell came out strongly in defence of medical administrators against the ill-founded criticism they often received from doctors. A large company of guests received a gracious toast from Sir Charles Hambro, a member of the board of governors, and, on their behalf, Sir Harold Boldero and Sir James Paterson Ross, P.R.C.S., replied.

1. *Times*, Oct. 8, 1955, p. 6.
2. First Aid and Early Treatment of Burns in the Royal Air Force. A.M. pamphlet 168. 2nd ed. Issued by the Air Ministry (D.G.M.S.), 1956. Obtainable from H.M. Stationery Office. 3s.

University of Leeds

At recent examinations the following were successful:

M.D.—Doreen Moorhouse.
M.B., Ch.B.—K. A. I. Cassimally, S. E. Cornford, B. W. Fowles, D. H. Fox, Beryl Heap, Cita V. Kershaw, Ann V. Kirkbride, C. W. Landon, Michael McGregor, M. G. Mayne, Elaine Merrington, M. D. Morris, S. A. Rance, P. J. Robinson, D. C. Robson, H. D. Rogers, Colin Skipper, A. W. Thorpe, M. P. Wales, J. H. White.
D.P.M.—M. W. Atkinson.
D.P.H.—Kathleen Haigh.

Royal Faculty of Physicians and Surgeons

A conference on psychiatry is to be held at the faculty 242, St. Vincent Street, Glasgow, from Monday, Oct. 28, to Friday, Nov. 1.

College of General Practitioners

Midland Faculty.—The college has arranged with the staffs of Worcester Royal Infirmary, Ronkswood Hospital, and Powick Hospital for six medical meetings to take place this autumn. The first will take place on Thursday, Oct. 24, at 3 P.M. at Worcester Royal Infirmary, when Dr. John Fry and Mr. T. S. Stewart will speak on Ts and As in Children. Further particulars may be had from Dr. A. J. Laidlaw, Thornelow Lodge, 29, Barbourne Road, Worcester.

Quaker Medical Society

At 5 P.M. on Saturday, Oct. 19, at an open meeting of this society to be held at Friends House, Euston Road, London, N.W.1, Dr. E. A. Blake Pritchard will give the first Lister lecture since 1939. He will speak on the acceptance of new ideas in medicine.

World Health Organisation

Three appointments have lately been made to the staff at headquarters. Dr. Wiktoria Winnicka has been appointed chief of the maternal and child health section, Dr. René Sansonnens chief of the section of health laboratory methods, and Dr. Isaac Nir-Grosfeld scientist in charge of food additives.

International Society of Hematology

The seventh congress of this society will be held in Rome at the Palazzo dei Congressi from Sept. 7 to 13, 1958. Further particulars may be had from the secretary of the congress, Istituto di Patologia Medica, Policlinico Umberto 1, Rome, Italy. The congress of the International Society of Blood Transfusions will be held at the Palazzo dei Congressi from Sept. 3 to 8.

Leicester Christian Medical Association

This association, which was founded in 1943 by Dr. N. C. Braithwaite and Dr. E K. Macdonald, will hold its first meeting of the autumn session on Friday, Oct. 18, when Dr. R. W. Luxton will speak on the challenge of our times. Other speakers during the session will include the Rev. E. C. Varah, Dr. E. F. Griffith, Dr. R. G. Cochrane, the Rev. Brian Hession, and Prof. F. F. Bruce. All the meetings will be held in the Leicester Royal Infirmary at 8.45 P.M. Further particulars may be had from the secretary, Dr. J. P. Anderson, 367, Uppingham Road, Leicester.

The Middlesex Hospital Medical School

Presiding over the annual dinner on Oct. 4, Dr. H. L. Marriott proposed the toast of The Middlesex Hospital and Medical School. He spoke of many honours gained by students and teachers; of new appointments; and of the kindness of the nurses and the excellence of the hospital's food. This, after all, was all the patients could judge the hospital by: they could not assess "the latest comic strip on plasma-proteins." Prof. B. W. Windeyer, the dean, announced that Lord Astor of Hever had added £50,000 to his recent gift of £400,000 to the school; new building would begin next month. Subscriptions had more than paid for the portrait of Sir Harold Boldero, and the excess would be used to found a scholarship. Dr. G. J. R. McHardy, responding as senior Broderip scholar, reassured former students about the present state of the school. Prof. A. Kekwick proposed The Chairman, who, he said, as resident medical officer in the '30s had insisted on the residents' reading medicine for an hour before breakfast.

Welsh Board of Health

Mr. K. H. Hodges has been appointed as the new chairman of the board in succession to Mr. H. H. Davies who is retiring at the end of December.

Broadmoor Institution

Dr. P. G. McGrath has been appointed medical superintendent at this institution in succession to the late Dr. S. G. James.

Royal Society of Tropical Medicine and Hygiene

A banquet to celebrate the golden jubilee of this society will be held at the Royal College of Surgeons of England, Lincoln's Inn Fields, London, W.C.2, on Tuesday, Nov. 12. Prince Philip, Duke of Edinburgh, will be present.

National Association for Mental Health

This association will hold its annual general meeting on Wednesday, Oct. 30, at 11 A.M., at 1, Wimpole Street, London, W.1. The telerecorded film of the first programme in the B.B.C. series *The Hurt Mind* will be shown after the formal business. At 2.30 P.M. there will be a discussion on the Hurt Mind Healed, when the speakers will include Dr. Joshua Bierer and Dr. G. D. Morgan.

St. George's Hospital Medical School

Owing to rebuilding in this school, the postgraduate lectures in neurology and psychiatry have been cancelled until further notice.

Society of Medical Officers of Health

The annual dinner of this society will be held on Thursday, Oct. 24, at 7.30 P.M. at the Royal College of Surgeons, Lincoln's Inn Fields, London, W.C.2. Dr. H. D. Chalke will preside, and the guests will include Sir Edward Boyle, M.P.

A joint meeting of this society and the British Tuberculosis Association will be held at the London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1, on Friday, Nov. 29, at 5.30 P.M.

The team of medical scientists who are visiting Iran under the auspices of the World Health Organisation will include Mr. H. Osmond-Clarke, Prof. R. E. Tunbridge, and Prof. W. J. E. Jessop.

Dr. A. Buchanan Barbour, director of medical services, British European Airways, has been appointed to the medical committee of the International Air Transport Association for two years.

Prof. C. F. W. Illingworth will visit Brisbane in September, 1958, as Edwin Tooth guest professor of surgery.

Diary of the Week

OCT. 13 TO 19

Monday, 14th

UNIVERSITY OF LONDON
5.30 P.M. (University College, Gower Street, W.C.1.) Prof. A. R. Luria (Moscow): The Rôle of Speech in Normal and Abnormal Behaviour. (Last of three lectures.)
5 P.M. (London School of Hygiene and Tropical Medicine, Keppel Street, W.C.1.) Prof. G. R. Hargreaves: Psychiatry and its Origins. (First of five Heath Clark lectures.)

INSTITUTE OF NEUROLOGY, The National Hospital, Queen Square, W.C.1
5.30 P.M. Prof. E. Herman (Lodz): Observations on Muscular Dystrophy.

KING'S COLLEGE MEDICAL SCHOOL, Royal Victoria Infirmary, Newcastle upon Tyne, 1
5.15 P.M. Prof. Erik Strömgren (Denmark): The Planning of the Psychiatric Services in Denmark. (First of two lectures.)

UNIVERSITY OF ST. ANDREWS
2 P.M. (Queen's College Hall, Dundee.) Mr. W. S. Morrison, M.P.: Some Makars and Makers of St. Andrews and Dundee.

Tuesday, 15th

UNIVERSITY OF LONDON
5 P.M. (London School of Hygiene and Tropical Medicine.) Professor Hargreaves: Psychiatry and Society. (Second Heath Clark lecture.)

ST. MARY'S HOSPITAL MEDICAL SCHOOL, London, W.2
5 P.M. Prof. J. Chassar Moir: Sir James Simpson—A Battle against Bigotry.

INSTITUTE OF DERMATOLOGY, Lisle Street, W.C.2
5.30 P.M. Dr. P. J. Hare: Sweat Production and Anomalies.

INSTITUTE OF CARDIOLOGY
5 P.M. (1, Wimpole Street, W.1.) Dr. A. Rae Gilchrist: Clinical Aspects of High Grade Heart Block. (St. Cyres lecture.)

SOCIETY FOR THE STUDY OF ADDICTION
8 P.M. (11, Chandos Street, W.1.) Dr. Philip Bradley: Studies on the Effects of Drugs on the Electrical Activity of the Brain and on Behaviour.

ROYAL ARMY MEDICAL COLLEGE, Millbank, S.W.1
5 P.M. Dr. F. Dudley Hart: Spondylitis.

Wednesday, 16th

UNIVERSITY OF LONDON
5 P.M. (London School of Hygiene and Tropical Medicine.) Professor Hargreaves: Psychiatry and Medical Administration. (Third Heath Clark lecture.)

ROYAL SOCIETY OF MEDICINE, 1, Wimpole Street, London, W.1
5 P.M. *Comparative Medicine.* Dr. J. B. Brooksby: Comparative Aspects in Virology. (Presidential address.)

POSTGRADUATE MEDICAL SCHOOL, Ducane Road, W.12
2 P.M. Dr. J. D. N. Nabarro: Diabetes and Carbohydrate Metabolism (I).

INSTITUTE OF DISEASES OF THE CHEST, Brompton, S.W.3
5 P.M. Dr. N. Lloyd Rusby: Presenting Manifestations of Intrathoracic Cancer.

INSTITUTE OF DERMATOLOGY
5.30 P.M. Dr. H. Haber: Dermis and Subcutaneous Tissue.

UNIVERSITY OF OXFORD
5 P.M. (Nuffield Maternity Home.) Dr. Clement A. Smith (Boston): Respiration and Resuscitation of the Newborn Infant.

NOTTINGHAM MEDICO-CHIRURGICAL SOCIETY, 64, St. James's Street, Nottingham
8.30 P.M. Dr. Samuel Oram: Domiciliary Treatment of Cardiac Infarction.

KING'S COLLEGE MEDICAL SCHOOL, Newcastle upon Tyne
5.15 P.M. Professor Strömgren: The Planning of the Psychiatric Services in Denmark. (Second of two lectures.)

ROYAL COLLEGE OF SURGEONS OF EDINBURGH, Edinburgh, 8
3 P.M. Prof. D. M. Dunlop: Surgery of the Diabetic.

Thursday, 17th

UNIVERSITY OF LONDON
5 P.M. (London School of Hygiene and Tropical Medicine.) Professor Hargreaves: Psychiatry and the Family Doctor. (Fourth Heath Clark lecture.)

INSTITUTE OF PSYCHIATRY
3 P.M. (Maudsley Hospital, Denmark Hill, S.E.5.) Dr. W. H. Thorpe, F.R.S.: Drive and Instinct in Animals. (First of three lectures.)

BRITISH POSTGRADUATE MEDICAL FEDERATION
5.30 P.M. (Senate House, University of London, W.C.1.) Dr. Julian Huxley, F.R.S.: Some Biological Aspects of Cancer.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE, Manson House, 26, Portland Place, W.1
7.30 P.M. Brigadier J. S. K. Boyd, F.R.S.: Dysentery—some Personal Experiences and Observations. (Presidential address.)

HYPNOTHERAPY GROUP
8 P.M. (1, Wimpole Street, W.1.) Dr. Nevil Leyton, Dr. Gerald Slot, Dr. Denys Kelsey: Migraine.

MANCHESTER MEDICAL SOCIETY
8 P.M. (Staff House, University of Manchester.) Anæsthetics. Dr. Margaret O'Grady: Reviewing the Past with Regard to the Changing Hazards. (Presidential address.)

Friday, 18th

ROYAL COLLEGE OF PHYSICIANS OF LONDON, Pall Mall East, S.W.1
3 P.M. Dr. Donald Hunter: Harvey and His Contemporaries. (Harveian oration.)

UNIVERSITY OF LONDON
5 P.M. (London School of Hygiene and Tropical Medicine.) Professor Hargreaves: Psychiatry and Public Health. (Last Heath Clark lecture.)

ROYAL SOCIETY OF MEDICINE
5 P.M. *Epidemiology and Preventive Medicine.* Dr. J. N. Morris, Dr. J. A. H. Lee, Mr. F. M. Martin, and Mr. L. Moss: Operational Research in the National Health Service.
5 P.M. *Pædiatrics.* Dr. Clement A. Smith (Boston): Measurement of Respiratory Function in Newborn Infants.
8.15 P.M. *Radiology.* Mr. E. Stanley Lee: Rôle of Surgery in Breast Carcinoma Today. Mr. R. W. Gunderson: Comparison of Two Radiotherapy Techniques in Breast Carcinoma. Dr. H. J. G. Bloom: Value of Histology in the Prognosis and Classification of Breast Cancer.

POSTGRADUATE MEDICAL SCHOOL
10 A.M. Dr. R. A. Shooter: Control of Staphylococcal Cross-Infection.

INSTITUTE OF LARYNGOLOGY AND OTOLOGY, Gray's Inn Road, W.C.1
5.30 P.M. Mr. N. Asherson: Otosclerosis.

INSTITUTE OF NEUROLOGY
5 P.M. Dr. André Thomas: Neurological Examination and Reaction of the Newborn Babe and Young Infant. (Film.)

KING'S COLLEGE MEDICAL SCHOOL, Newcastle upon Tyne
5.15 P.M. Professor Strömgren: Psychogenic Psychosis.

MEDICO-CHIRURGICAL SOCIETY OF EDINBURGH
8.30 P.M. *With the Royal Medico-Chirurgical Society of Glasgow* (Adam House, Chambers Street, Edinburgh.) Dr. J. R. McCutcheon, Dr. J. A. W. McCluskie, Prof. Robert McWhirter, and Dr. James Innes: Is Medical Education of the Public Desirable?

Saturday, 19th

INSTITUTE OF LARYNGOLOGY AND OTOLOGY
11.30 A.M. Prof. Chevalier L. Jackson (Philadelphia): Thyrotomy and Partial Laryngectomy.

BIOCHEMICAL SOCIETY
2 P.M. (Physiology lecture theatre, Guy's Hospital Medical School, S.E.1.) Short papers.

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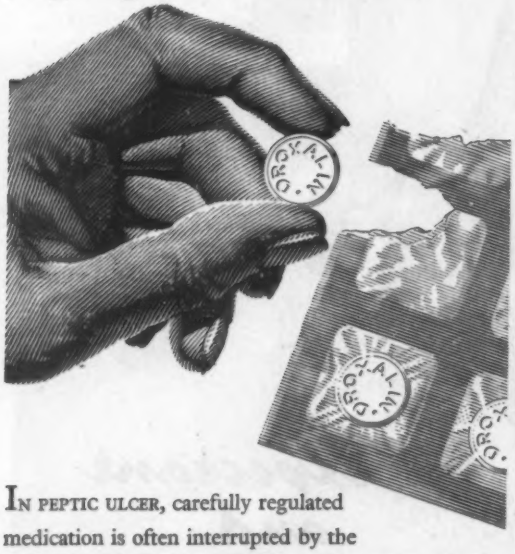

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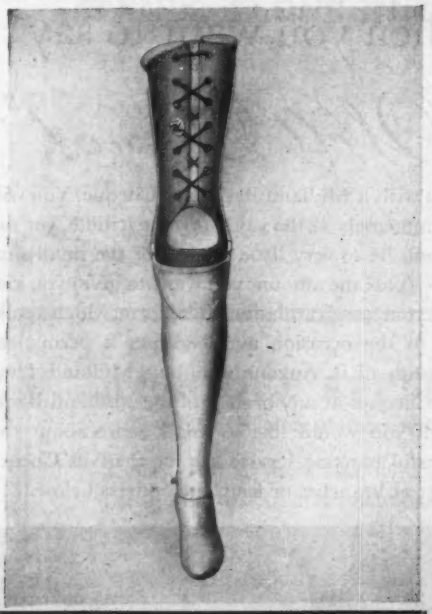

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Academic and Educational

UNIVERSITY OF MANCHESTER
DEPARTMENT OF EDUCATION OF THE DEAF

A COURSE for Health Visitors and other suitable persons working with children, on the theory and practice of screening tests of the hearing of babies and children of pre-school age, will be held in the Department of Education of the Deaf, University of Manchester, from 28TH to 30TH JANUARY, 1958, inclusive. Applicant's fee of £2 2s. for each member of the course will be payable to the Bursar.

Applications should be made to the Director, Department of Education of the Deaf, The University, Manchester, 13.

UNIVERSITY OF MANCHESTER
DEPARTMENT OF EDUCATION OF THE DEAF

A COURSE for a limited number of medical officers engaged in the Public Health Service, will be held in the Department of Education of the Deaf, The University, Manchester, from 11TH to 14TH FEBRUARY, 1958, inclusive. Subjects of the course will include the principles and practice of screening tests of hearing, procedures for the assessment of residual capacity to hear in young children, and home guidance of the parents of deaf children. A fee for the course will be £4 4s.

Applications should be made to the Director, Department of Education of the Deaf, The University, Manchester, 13.

UNIVERSITY OF MANCHESTER
DEPARTMENT OF EDUCATION OF THE DEAF

An INTERNATIONAL CONGRESS ON THE EDUCATIONAL TREATMENT OF DEAFNESS will be held from 15TH to 23RD JULY, 1958, inclusive, in the University. Members of the Department of Education of the Deaf and delegates from other countries have agreed to demonstrate and discuss the results of recent research on the problems of deafness in childhood. A fee of £3 will be charged to each member of the congress.

Inquiries and requests for forms of application should be addressed to Prof. A. W. G. EWING, Department of Education of the Deaf, The University, Manchester, 13.

BRITISH POSTGRADUATE MEDICAL FEDERATION
(UNIVERSITY OF LONDON)
INSTITUTE OF ORTHOPÆDICS

COURSE ON DISORDERS OF JOINTS
14TH–16TH NOVEMBER, 1957

Thursday, 14th November, 1957—Town Section (234, Great Portland-street, W.1)

10.00–11.00..Manipulation ..Mr. H. JACKSON BURROWS
11.30–12.45..Rheumatoid Arthritis ..Dr. R. NASSIM
2.00–3.15..Radiology of Joint Disease ..Dr. R. O. MURRAY

Friday, 15th November, 1957—Town Section

10.00–11.00..Contractures ..Mr. J. I. P. JAMES
11.30–12.45..Clinical Demonstration ..Mr. A. T. FRIPP
2.00–3.00..Bacteriology in Joint Disease ..Dr. C. H. LACK
3.00–4.00..Ankylosing Spondylitis ..Prof. B. W. WINDEYER

Saturday, 16th November, 1957—Country Section (Brockley Hill, Stanmore, Middlesex)

9.30–11.00..General Ward Round ..Mr. K. I. NISSEN
11.30–12.30..Arthrodesis and Arthroplasty ..Mr. D. TREVOR
2.00–3.30..Joint Tuberculosis ..Mr. J. A. CHOLMELEY
4.00–5.00..Joint Tuberculosis ..Dr. F. H. STEVENSON

The fee for this course (including coffee, lunch and tea) is 3 guineas.

Early application should be made to the Dean, at 234, Great Portland-street, London, W.1.

THE LONDON HOSPITAL MEDICAL COLLEGE

COURSE IN ADVANCED MEDICINE

A POSTGRADUATE COURSE IN MEDICINE will be held at The London Hospital commencing MONDAY, 6TH JANUARY, and finishing FRIDAY, 14TH MARCH, 1958. Classes will be held on Mondays, Wednesdays and Fridays. The course will be limited to 24 students.

The fee for the course will be £25. An entrance fee of £5 5s. must be paid by Non-London Hospital Graduates.

Applications should be made to the Dean.

H. B. MAY, M.A., M.D., F.R.C.P., Dean.

The London Hospital Medical College, Turner-street, E.1.

INSTITUTE OF OBSTETRICS AND GYNÆCOLOGY

An INTENSIVE COURSE, suitable for postgraduates preparing for higher examinations (M.R.C.O.G. and M.D.), is being held from 2ND DECEMBER to 14TH DECEMBER, 1957, at Queen Charlotte's Maternity Hospital, the Chelsea Hospital for Women, and the Department of Obstetrics and Gynæcology at Hammersmith Hospital.

The fee for the course is £14 14s. (14 guineas).

Applications should be sent to the Secretary, Institute of Obstetrics and Gynæcology at Chelsea Hospital for Women, Dovehouse-street, London, S.W.3.

AMENDED DATES
L.M.S.S.A.

FINAL EXAMINATION: MEDICINE, 11th November, 9th December, 1957, 13th January, 1958. SURGERY, 11th November, 9th December, 1957, 13th January, 1958. MIDWIFERY, 12th November, 10th December, 1957, 14th January, 1958. PATHOLOGY, 12th November, 10th December, 1957, 14th January, 1958. MASTERY OF MIDWIFERY, May and November. DIPLOMA IN INDUSTRIAL HEALTH, July and December.

For regulations apply REGISTRAR, Apothecaries Hall, Black Friars-lane, London, E.C.4.

EDINBURGH POST-GRADUATE BOARD FOR MEDICINE

GENERAL SURGERY

3-months courses of postgraduate Surgery suitable for surgeons requiring a refresher course in the current outlook on general surgery or for graduates preparing to specialise in surgery, start on 17TH MARCH and 29TH SEPTEMBER, 1958. The programme has been arranged so as to provide coördinated clinical and systematic instruction in general surgical wards and specialised surgical units in Edinburgh. Fee £31 10s.

MEDICAL SCIENCES

A 3-months course in Applied Anatomy, Physiology, Pathology, Bacteriology and Biochemistry will begin on 23RD JUNE, 1958. This course includes an adequate amount of practical instruction and is suitable for postgraduates wishing to take the Primary Fellowship examination. Fee £31 10s.

2 courses in the Basic Sciences (Anatomy, Physiology, Pathology, including Bacteriology) are arranged by the Royal College of Surgeons under the ægis of the Edinburgh Post-Graduate Board for Medicine. These courses, comprising lectures, demonstrations and practical instruction, will begin in the middle of FEBRUARY and the middle of OCTOBER, 1958, and continue for 10 weeks. Fee £26 5s.

The courses in Medical Sciences are designed as a final preparation for the Primary Fellowship Examination and it is essential that those attending should already have a considerable knowledge of the subjects.

INTERNAL MEDICINE

Courses lasting 12 weeks, suitable for graduates desiring a refresher course or to specialise in Medicine, begin on 24TH MARCH and 29TH SEPTEMBER, 1958. These courses consist of 320 hours instruction comprising lectures, clinical demonstrations and ward visits. Fee £31 10s.

HILL PATTISON-STRUTHERS BURSARIES OF £100

The Royal College of Physicians of Edinburgh award 2 Hill Pattison-Struthers Bursaries each year to graduates attending the Internal Medicine course. Each bursary amounts to £100. Applications must be submitted to The Secretary, Royal College of Physicians of Edinburgh, 9, Queen-street, Edinburgh, 2, before 16th December, 1957, for those attending the March course and before 17th June, 1958, for those attending the September course.

Additional instruction in Clinical Pædiatrics and in Tropical Medicine is arranged in conjunction with the course in Medicine. There is a small additional fee and the numbers are limited.

Applications for enrolment should be addressed to The Director of Post-Graduate Studies, Surgeons' Hall, Edinburgh, 8. Applicants for courses, except general practitioners, should supply particulars of qualifications and postgraduate experience.

THE ROYAL SOCIETY

GOVERNMENT GRANT FOR SCIENTIFIC INVESTIGATIONS

Applications for grants from the third allotment of the Government Grant for Scientific Investigations for the year 1957 should be made as soon as possible on forms of application to be obtained from the Assistant Secretary of the Royal Society, Burlington House, London, W.1, No application can be considered which is received later than 20TH NOVEMBER, 1957.

Applicants must be of British nationality, resident in Great Britain or Northern Ireland. Grants may be made for purposes in connection with the promotion and support of research in pure science other than for personal maintenance or payment of stipends; for the assistance of scientific expeditions and collections; but not in aid of scientific publications.

ST. MARY'S HOSPITAL MEDICAL SCHOOL. Sandoz RESEARCH FELLOW required for an initial period of 3 years for work in the Medical Unit on the Effects of Vasoactive Peptides on the Human Circulation. Medical qualification essential. Salary £1000 p.a.

Applications, in duplicate, with the names of 2 referees, to the Secretary, St. Mary's Hospital Medical School, Paddington, W.2, by 31st October, 1957.

ST. MARY'S HOSPITAL MEDICAL SCHOOL. Applications are invited for the appointment of ASSISTANT LECTURER IN PHYSIOLOGY for a period of 3 years in the first instance. Science qualification essential, medical qualification desirable. Salary within scale £850–£50–£1050, plus £60 London allowance. F.S.S.U. and children's allowance.

Applications (2 copies), together with names of 2 referees, should be sent by 1st November, to the Secretary Sr. Mary's Hospital Medical School, Paddington, W.2, from whom further particulars may be obtained.

BRITISH POSTGRADUATE MEDICAL FEDERATION (UNIVERSITY OF LONDON). INSTITUTE OF ORTHOPÆDICS, ROYAL NATIONAL ORTHOPÆDIC HOSPITAL, 234, Great Portland-street, London, W.1. Applications are invited for the post of ASSISTANT IN MORBID ANATOMY. The post will provide experience of routine orthopædic pathology and opportunity for research. Interest in experimental work an advantage. Salary £1150–£100–£1750 according to experience. Tenable in the first instance for 1 year, and renewable.

Applications, with the names of 2 referees, should be sent, by 31st October, 1957, to the Dean, from whom further particulars may be obtained.

UNIVERSITY OF ST. ANDREWS, Queen's College, DUNDEE. DEPARTMENT OF CHILD HEALTH. The University Court of the University of St. Andrews invites applications for a LECTURESHIP IN CHILD HEALTH in Queen's College, Dundee, commencing 1st January, 1958. Salary £1500–£100–£1900. F.S.S.U. and family allowance benefits; a grant towards removal expenses will be made. The person appointed will receive an honorary appointment from the Eastern Regional Hospital Board.

Applications (6 copies), which should contain the names of 3 referees, should be lodged with the undernoted not later than 31st October, 1957.

PATRICK CUMMING, Joint Clerk to the University Court.

THE BRITISH ORTHOPÆDIC ASSOCIATION invites applications for a TRAVELLING SCHOLARSHIP of approximately 6 months duration to visit 1 or more centres in the United Kingdom or abroad (excluding the dollar area). The sum available will be not less than £500, and may be increased as necessary for living expenses and travel up to £1000. The object of the visit, the proposed itinerary, and the previous clinical experience and research contributions of the candidate, will be major contributions in making the award.

Applications should be made to the Secretary, British Orthopædic Association, 45, Lincoln's Inn-fields, London, W.C.2, not later than 15th November, 1957. Short-listed candidates will be interviewed on 6th December, 1957. Application forms may be obtained at the above address.

UNIVERSITY COLLEGE OF THE WEST INDIES. Applications are invited for (*a*) SENIOR LECTURESHIP or (*b*) LECTURESHIP IN GENERAL SURGERY. Salary scales: (*a*) £1700–£100–£2400 p.a.; (*b*) £1100–£100–£1500–£100–£1900 p.a. Entry point determined by qualifications and experience. Child allowance. F.S.S.U. Unfurnished accommodation if available at 5% of basic salary or allowance in lieu. Passages for up to 5 persons on appointment, normal termination and study leave (once every 3 years). Duties to be assumed by 1st January, 1958, or as soon as possible thereafter.

Detailed applications (10 copies), and naming 3 referees, by 4th November, 1957, to Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

UNIVERSITY OF BELFAST. Applications are invited for a LECTURESHIP IN BIOCHEMISTRY. Salary range £900–£50–£1300, and on certain conditions being fulfilled to £1650, plus contributory pension rights under the F.S.S.U. Initial placing on the scale £900–£1300 is dependent on experience and qualifications.

Applications should be received by 1st November, 1957. Further particulars may be obtained from the Secretary, The Queens University of Belfast, Belfast, Northern Ireland.

UNIVERSITY COLLEGE, Ibadan, Nigeria. Applications are invited for:—

SENIOR LECTURESHIP IN SURGERY.
LECTURESHIP IN TRAUMATIC SURGERY.

Salary scales:

Senior Lecturer: £1850–£100–£2450 p.a.
Lecturer: £1700–£100–£2100 p.a.

Appointment from as soon as possible for 3 years in first instance. Successful candidates will be offered Honorary Consultant appointments at the University College Hospital. Allowance for up to 3 children, £50 p.a. per child resident in Nigeria, £100 p.a. per child resident elsewhere. Part furnished accommodation at rent not exceeding 7·7% of salary. Passages for appointee, wife and up to 3 children under 11 years on appointment, overseas leave and termination. F.S.S.U. Outfit allowance £60.

Detailed applications (10 copies), naming 3 referees, by 4th November, 1957, to Secretary, Senate Committee on Colleges Overseas in Special Relation, University of London, Senate House, London, W.C.1, from whom further particulars may be obtained.

Hospital Services: Senior Appointments

NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD.

(1) CHILD PSYCHIATRIST (7 half-days a week), Senior Hospital Medical Officer grade, Willesden Child Guidance Centre, 22, Brondesbury-villas, Kilburn, N.W.6 (Tel.: MAIda Vale 0621).

Applications before 8th November, 1957.

(2) CONSULTANT PSYCHIATRIST (part-time, 3 half-days a week), Marlborough Day Hospital, 38, Marlborough-place, St. John's Wood, N.W.8.

Applications before 4th November, 1957.

Hospital and Centre may be visited by direct appointment.

Application forms obtainable from, and returnable to, Secretary, North West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1.

UNIVERSITY COLLEGE HOSPITAL, Gower-street, London, W.C.1. Applications are invited for the appointment of CONSULTANT PHYSICIAN in Diseases of the Chest to attend 4 notional half-days per week. The duties of this appointment will include the Holborn Chest Clinic. Further particulars can be obtained from the Administrator and Secretary.

Applications (12 copies), with the names of 3 referees, should reach the Administrator and Secretary by 1st November, 1957.

CHICHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Anæsthetics. Locum ANÆSTHETIST (5 half-days per week) required pending substantive Consultant appointment. Consultant, Senior Hospital Medical Officer, or Senior Registrar's remuneration according to grading of successful applicant. Group covers Royal West Sussex and St. Richard's Hospitals, Chichester, Bognor Hospital, and Midhurst and Petworth Hospitals.

Inquire of Group Secretary, 174, Broyle-road, Chichester.

BIRMINGHAM REGIONAL HOSPITAL BOARD. Applications are invited from duly qualified medical practitioners for the whole-time post of SENIOR ADMINISTRATIVE MEDICAL OFFICER at a salary of £2900–£140 (5)–£3600 p.a. subject to National Health Service superannuation regulations. Experience of hospital administration essential. Duties: to act as adviser to the Board on the planning, organisation and staffing of the hospital and specialist services of the Region, and such administrative and executive functions as may be assigned to him.

Applications (15 copies), stating qualifications and experience, together with the names of 3 referees, should be addressed to the Secretary of the Board (from whom further particulars of the post may be obtained) at 10, Augustus-road, Edgbaston, Birmingham, 15, by 28th October. Canvassing will disqualify.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

Part-time SENIOR HOSPITAL MEDICAL OFFICER in Venereology (2 notional half-days weekly), V.D. Clinic, Nuneaton. Experience specialty desirable.

Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer), All Saints' Hospital, Birmingham. Opportunity for work in research in conjunction with Birmingham University. Considerable experience specialty essential.

Applications (15 copies), stating name, age, nationality, present and previous appointments and details of 3 referees, to Secretary, 10, Augustus-road, Birmingham, 15, by 11th November, 1957.

CARDIFF. THE UNITED CARDIFF HOSPITALS. Applications are invited for the appointment of SENIOR CASUALTY OFFICER at the Cardiff Royal Infirmary. The successful candidate will also be attached to the Fracture Department of the Hospital. Non-resident appointment to commence as soon as possible for a period of up to 4 years. Salary on the scale £1653 15s.–£52 10s.–£1811 5s. in the fourth year.

Application forms are available from the Secretary to the Board at the Cardiff Royal Infirmary, Newport-road, Cardiff, and should be returned within 14 days of the appearance of this advertisement.

LEEDS REGIONAL HOSPITAL BOARD.

CONSULTANT in Radiology (whole-time or maximum part-time). Duties divided approximately equally between hospitals in the York A and Tadcaster and the Scarborough, Bridlington, Malton and Whitby Hospital Management Committee Groups. The successful applicant will be required to reside in Scarborough.

Part-time CONSULTANT in Dentistry (2 sessions per week) for duties mainly at Clayton Hospital, Wakefield, together with additional duties at other hospitals in the Wakefield, Pontefract, Dewsbury and Goole areas.

Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer scale), Storthes Hall Hospital (2680 Beds), Kirkburton, near Huddersfield, and associated clinics at neighbouring general hospitals. Resident or non-resident. Large modern flat available if required. Accommodation also available for a single person. Candidates should normally hold a D.P.M. but applications will also be considered from candidates without previous experience in psychiatry who hold a higher medical qualification, have had wide experience in general medicine in the Senior Registrar grade and intend to obtain a D.P.M. and specialise in psychiatry.

Whole-time ASSISTANT RADIOTHERAPIST (Senior Hospital Medical Officer scale) in the Regional Radiotherapy Service for duties mainly at the Hull Royal Infirmary. Relief duties as may be required at other Radiotherapy Centres in the Region. The person appointed to work under the supervision of the Consultant in Radiotherapy and to reside in the Hull area.

Applications (12 copies), stating age, qualifications and details of present and previous appointments with dates, and name and addresses of 3 referees, to the Secretary, Park-parade, Harrogate, by 21st October, 1957.

LIVERPOOL REGIONAL HOSPITAL BOARD. Deva, HOSPITAL, near CHESTER. Applications are invited for the post of Whole-time ASSISTANT PSYCHIATRIST (Senior Hospital Medical Officer) with duties at the above Hospital, including attendance at outpatient clinics outside the Hospital. Applicants should possess the D.P.M. or equivalent qualification and have reasonable experience in psychiatry, including practical knowledge of outpatient work. Residential accommodation is available.

Forms of application from Dr. T. Lloyd Hughes, Senior Administrative Medical Officer, Liverpool Regional Hospital Board, 19, James-street, Liverpool, 2, to be returned not later than 2nd November, 1957.

VINCENT COLLINGE, Secretary to the Board.

MANCHESTER REGIONAL HOSPITAL BOARD. Additional maximum Part-time CONSULTANT RADIOLOGIST to the Burnley and District Hospital Centre, mainly at the Victoria Hospital, Burnley, but including duties at Burnley General and Reedyford Memorial Hospitals. Wide experience and higher qualifications essential; appointee to live in or near Burnley.

Application forms from the Senior Administrative Medical Officer to the Board, Cheetwood-road, Manchester, 8, to be returned by 28th October, 1957.

NEWCASTLE REGIONAL HOSPITAL BOARD. ASSISTANT PATHOLOGIST (Senior Hospital Medical Officer status) for Hartlepools Group of hospitals. Main hospitals General, West Hartlepool (466 Beds); Hartlepools (112 Beds); Cameron (73 Beds). Appointment whole-time or part-time for minimum of 9 notional half-days per week. Further particulars from Consultant Pathologist, General Hospital, West Hartlepool. Unfurnished flat available.

Applications, with names and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 28 days.

SHEFFIELD REGIONAL HOSPITAL BOARD. Maximum Part-time CONSULTANT RADIOLOGIST required for the Rotherham Group of hospitals.

Application form and further details from the Senior Administrative Medical Officer, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield. Forms to be returned by 9th November, 1957.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT E.N.T. SURGEON (5 half-days per week) in the St. Helier Group for duties at St. Helier Hospital, Carshalton, and Sutton and Cheam Hospital, Sutton.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 9th November, 1957. Applicants may visit hospitals by local arrangement.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD requires Part-time CONSULTANT RADIOLOGIST (5 half-days per week) for the Chichester Group of hospitals. Candidates should have F.F.R. preferably, or D.M.R., and wide experience in radiology.

Applications by letter (5 copies), giving date of birth, qualifications, experience, and names of 3 referees, to Secretary (S.1), South West Metropolitan Regional Hospital Board, 11A, Portland-place, W.1, by 9th November, 1957. Applicants may visit hospitals by local arrangement.

SCOTLAND. EASTERN AND SOUTH-EASTERN REGIONAL HOSPITAL BOARDS. Radiology. Applications are invited for the appointment of a Whole-time RADIOLOGIST (Consultant) to undertake duties in the Dundee General Hospitals and in Fife. The person appointed will be based on Dundee and although initially his duties will be confined to the Dundee General Hospitals (Dundee Royal Infirmary and Maryfield Hospital—General Teaching Hospitals associated with the University of St. Andrews) he may be required to devote a substantial proportion of his time—but not more than half—to radiological duties in hospitals in the Eastern half of the County of Fife.

Forms of application and further particulars from the Secretary, Eastern Regional Hospital Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 12th November, 1957.

SCOTLAND. WESTERN REGIONAL HOSPITAL BOARD. Applications are invited for the following appointments—

Whole-time CONSULTANT PSYCHIATRIST at the Crichton Royal Mental Hospital, Dumfries. Preference will be given to candidates holding a higher qualification in general medicine. A house is available if desired.

Whole-time ASSISTANT PATHOLOGIST at the Dumfries and Galloway Royal Infirmary, Dumfries. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Whole-time ASSISTANT PSYCHIATRIST at Gartloch Mental Hospital, Gartcosh, Glasgow. Salary (at age 32 and over) on the scale £1653 15s.–£52 10s.–£2126 5s.

Applications (16 copies), stating date of birth, qualifications, experience, present appointment, and the names of 3 referees, to reach the Secretary, Western Regional Hospital Board, 64, West Regent-street, Glasgow, C.2, not later than 30 days after the publication of this advertisement.

U.S.A. NORTH CAROLINA SANATORIUM, McCain, NORTH CAROLINA, U.S.A. Required, PHYSICIANS for full-time employment in 600-Bed Chest Disease Hospital. Salary: Physician I, $7884–$9396; Physician II, $9360–$11,040. Attractive living accommodations for family and single persons at reasonable cost. Hospital affiliated in residency training programmes in medicine and surgery. Located in Central North Carolina, within easy driving range of mountain and seashore resort areas. Year round mild climate. Liberal vacation and sick leave. Retirement and insurance programmes available. Must speak English. Appointments available for 1st January and 1st July, 1958.

Write: Assistant Medical Director.

Hospital Services: Junior Appointments

BETHLEM ROYAL HOSPITAL AND THE MAUDSLEY HOSPITAL. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER for the period from 1st January, 1958, to 7th April, 1959, at the above Postgraduate Teaching Hospital, with which is associated the Institute of Psychiatry (University of London). Experience in general medicine and neurology or in the basic sciences is an advantage.

Applications, giving details of experience and the names of 2 referees, should be made within 2 weeks of the appearance of this advertisement. Applications forms obtainable from K. J. JOHNSON, House Governor and Secretary, Maudsley Hospital, Denmark-hill, S.E.5.

CENTRAL MIDDLESEX HOSPITAL, Park Royal, N.W.10. Pre-registration RESIDENT HOUSE OFFICER required in Obstetrics and Gynæcology Department. Post recognised D.Obst.R.C.O.G. and M.R.C.O.G. examinations. Pre-registration candidates only will be considered. Post vacant 20th November.

Applications, with 2 testimonials, to Medical Director by 19th October.

CITY OF LONDON MATERNITY HOSPITAL, Hanley-road, London, N.4. RESIDENT SENIOR HOUSE OFFICER (obstetrics). Appointment vacant 1st December for period of 12 months. Applicants must have had previous obstetric experience. Recognised for M.R.C.O.G.

Application form obtainable from Hospital Secretary and returnable by 12th November.

ELIZABETH GARRETT ANDERSON HOSPITAL, Euston-road, N.W.1. ROYAL FREE HOSPITAL GROUP. Applications are invited from registered Women medical practitioners for the post of Full-time SURGICAL REGISTRAR (non-resident). Recognised for the F.R.C.S. examination. Appointment for 1 year in the first instance, to commence 1st January, 1958. Salary in accordance with Ministry of Health scale for Registrars.

Applications, with names of 3 referees, should be sent to the Secretary, Elizabeth Garrett Anderson Hospital, by 17th October, 1957.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 60, Grove End-road, London, N.W.8. Applications are invited from pre-registration or registered medical practitioners (Male) for the appointment of HOUSE SURGEON, to become vacant on Thursday, 7th November. This post is recognised for purposes of the F.R.C.S. (Eng.). Appointment will be for a period of 6 months. National Health Service salary.

Applications should reach the Secretary on or before Wednesday, 23rd October, together with copies of 3 recent testimonials.

GROUP PATHOLOGICAL LABORATORY, at St. Mary ABBOTS HOSPITAL, Marloes-road, Kensington, W.8. SENIOR HOUSE OFFICER (pathology) for duty in first instance at the Group Laboratory. Post vacant immediately. Post resident or non-resident, with training in 4 branches of pathology.

Applications by 19th October, 1957, on forms obtainable from Hospital Secretary. (L92.)

HIGHLANDS GENERAL HOSPITAL, Winchmore Hill, N.21. SENIOR HOUSE OFFICER (medical) resident for Chest Unit (100 Beds). Duties include tuberculosis work and investigation and treatment of chest diseases under supervision of the Finchley Chest Clinic. Also general medical and geriatric work.

Applications, with copies of 3 testimonials, to Hospital Secretary.

LONDON CHEST HOSPITAL. Hospitals for Diseases OF THE CHEST. 2 vacancies occur 1st December, 1957, for RESIDENT HOUSE PHYSICIAN. Appointment for 6 months, 4 in London, 2 at the Country Branch, near Letchworth, and posts graded as House Officer. Duties include work in the Outpatient Department and special clinics, as well as in wards.

Applications, stating date of birth, qualifications with dates, and previous appointments held, with copies of 3 testimonials, should reach the undersigned not later than 24th October.

THOMAS BROWN, House Governor.

London Chest Hospital, E.2.

LONDON HOSPITAL, Whitechapel, E.1. Applications are invited for the post of Part-time REGISTRAR to the Department of Plastic Surgery. A higher qualification although desirable is not essential. The successful candidate will be required to attend on 6 half-days weekly, and the duties will be divided between The London Hospital, its Annexe at Brentwood, and the Hackney Hospital.

Applications (12 copies), giving the names and addresses of 3 referees, should be received by the undersigned by 25th October, 1957. H. BRIERLEY, House Governor.

LONDON JEWISH HOSPITAL, Stepney Green, E.1. (130 Beds.) HOUSE SURGEON (pre- or post-registration) required for 6 months. Post vacant immediately.

Applications, stating age, experience, &c., and copies of not more than 3 testimonials, to be sent to the Hospital Secretary not later than 18th October, 1957.

MIDDLESEX HOSPITAL, W.1. Applications invited for posts of:—

CASUALTY MEDICAL REGISTRAR.
CASUALTY SURGICAL REGISTRAR.

Vacant 1st January.

Rules and application forms obtainable from Deputy Superintendent should be returned, naming 2 referees, by 6th November.

MIDDLESEX HOSPITAL, W.1. Applications invited for post of SENIOR HOUSE OFFICER at St. Luke's-Woodside Hospital, N.10. This is the Inpatient Department of psychological medicine of the Middlesex Hospital and is recognised for part of the training for the D.P.M. examination.

Forms of application obtainable from Deputy Superintendent, The Middlesex Hospital, should be returned, naming 2 referees, by 6th November.

MIDDLESEX HOSPITAL AND NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications invited for post of REGISTRAR (Accident Officer) in the Orthopædic Department, vacant 1st January. Appointment for 1 year at the Middlesex Hospital and a second year at the Luton and Dunstable Hospital under the control of the North West Metropolitan Regional Hospital Board.

Rules and application forms obtainable from Deputy Superintendent, The Middlesex Hospital, should be returned, naming 2 referees, by 6th November.

MILDMAY MISSION HOSPITAL, Austin-street, Bethnal Green, E.2. Applications are invited from registered medical practitioners for the post of SENIOR HOUSE OFFICER (resident). Recognised for the F.R.C.S. Vacant 9th November, 1957. The appointment is for 1 year. Salary £819 10s., less residential charges. Candidates should be in full sympathy with the evangelistic aims of the Hospital.

Applications and references to be addressed to the Medical Superintendent.

NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD.

REGISTRAR in Pathology (resident or non-resident), St. Andrew's Hospital, Billericay, Essex. Excellent facilities for training in all branches of pathology.

MEDICAL REGISTRAR (non-resident, sleeping in on duty nights), North Middlesex Hospital and Annexes, Edmonton, N.18. Higher qualification in medicine desirable. Endocrine experience an advantage. Duties may include teaching.

REGISTRAR in Mental Deficiency (married or single accommodation available), Royal Eastern Counties Hospital, Colchester, Essex. Recognised for 1 year for D.P.M.

ANÆSTHETIC REGISTRAR (resident or non-resident if near Hospital and on telephone), Harold Wood Hospital, Harold Wood, Essex. Recognised for D.A. and F.F.A.R.C.S.

REGISTRAR in Obstetrics and Gynæcology (resident), North Middlesex Hospital and Annexes, Edmonton, N.18. Recognised for M.R.C.O.G. as a combined post. If successful candidate holds M.R.C.O.G., or has fulfilled R.C.O.G. residential requirements for same, partial non-residence would be considered.

REGISTRAR in Obstetrics and Gynæcology (resident), Forest Gate Hospital, Forest-lane, E.7. Recognised for M.R.C.O.G. Previous experience essential.

REGISTRAR in Obstetrics (resident) (Female preferred), The Mothers' Hospital (Salvation Army), Lower Clapton-road, E.5. Recognised for M.R.C.O.G.

Appointments subject to review after 1 year.

Application forms from Secretary, 11A, Portland-place, W.1, to be returned by 26th October, 1957.

MILE END HOSPITAL, Bancroft-road, London, E.1. (484 Beds—obstetric beds 69, gynæcological beds 31.) Applications are invited for the following posts :—

SENIOR HOUSE OFFICER (obstetrics and gynæcology), vacant on 31st December, 1957.

HOUSE SURGEONS (post-registration), obstetrics and gynæcology. Vacancies on 4th November, 1957, and 15th February, 1958.

The above posts are recognised for the M.R.C.O.G.

Application forms, obtainable from Physician-Superintendent, to be returned by 18th October, 1957, with copies of not more than 3 testimonials.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (whole-time) to the Lysholm X-ray Department at The National Hospital, Queen-square, W.C.1. This post carries the grade of Registrar. Applicants should hold a Diploma in Diagnostic Radiology and have had experience in general radiology. The appointment will be for 6 months in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 28th October, 1957.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NATIONAL HOSPITALS FOR NERVOUS DISEASES. Applications are invited from registered medical practitioners for the appointment of REGISTRAR (non-resident) at The National Hospital, Queen-square, W.C.1. This post carries the grade of Senior Registrar. Previous neurological experience and higher medical qualification are desirable. The appointment will be for 1 year in the first instance.

Applications, with names of 3 referees, to be sent to the undersigned not later than 28th October, 1957.

H. EWART MITCHELL, Secretary to the Board of Governors.

The National Hospitals for Nervous Diseases,
Queen-square, London, W.C.1.

NORTH MIDDLESEX HOSPITAL, Edmonton, N.18. CASUALTY OFFICER (Senior House Officer grade). 6 months appointment, starting 18th November. Non-resident. Recognised for F.R.C.S. 3 Casualty Officers employed : duties include service with the 3 main Surgical Units.

Applications, stating age, nationality, qualifications, experience, with copies of recent testimonials and/or names of 2 referees, to Hospital Secretary by 22nd October.

ROYAL FREE HOSPITAL. Applications are invited for the post of RESIDENT PATHOLOGIST (House Officer), vacant immediately, from registered Men and Women practitioners. The post is for 6 months, renewable for a further 6 months. Salary and conditions of service in accordance with the scale laid down by the Ministry of Health for House Officers.

Application forms may be obtained from the Secretary, Royal Free Hospital, Gray's Inn-road, W.C.1, to whom they should be returned as soon as possible.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Thoracic Surgery for duty at the Regional Thoracic Unit at the Brook General Hospital, Shooters Hill, S.E.18, and also at Grove Park Hospital, Marvels-lane, Lee, S.E.12. The work includes both tubercular and non-tubercular chest surgery. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 26th October, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time appointment as RESIDENT SURGICAL OFFICER to fill a vacancy in the approved establishment at the Camberwell Group of hospitals. The salary will be £1061 10s. p.a., and the appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and will be for 1 year in the first instance, renewable for a further year.

Applications, giving particulars of age, qualifications, and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 26th October, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in General Surgery to fill a vacancy in the approved trainee establishment in the Woolwich Group of hospitals. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 26th October, 1957.

ST. MARY'S HOSPITAL, W.2. Registrar (whole-time) to the Psychiatric Department required ; previous experience in psychiatry essential and preference will be given to candidates holding the D.P.M. The appointment is for a first period of 12 months from 1st November, 1957.

Applications, stating nationality, date of birth, permanent address, qualifications with dates, details and gradings of previous and present appointments, together with names and addresses of 3 referees, should reach ALAN POWDITCH, House Governor, not later than 21st October, 1957.

SOUTH LONDON HOSPITAL FOR WOMEN AND CHILDREN, Clapham Common, S.W.4. Applications are invited from pre-registration and registered Female medical practitioners for the appointment of GYNÆCOLOGICAL HOUSE SURGEON, vacant 5th December, 1957. Recognised for the M.R.C.O.G.

Application forms from the Secretary.

ST. BARTHOLOMEW'S HOSPITAL, E.C.1, AND NORTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of SENIOR REGISTRAR in Anæsthetics, tenable for a period of 4 years from 1st January, 1958. The first year of service will be spent at St. Bartholomew's Hospital and the second at either Chase Farm Hospital, Enfield, or the North Middlesex Hospital, Edmonton. The programme for the third and fourth years will be by arrangement between the hospitals mentioned. Candidates must be in possession of the F.F.A.R.C.S.

Applications (12 copies), together with the names of 3 referees, should be submitted to the undersigned within the next 14 days.

C. C. CARUS-WILSON, Clerk to the Governors.

ST. CLEMENT'S HOSPITAL, Bow, E.3. House Physician (not pre-registration) for general medical wards.

Applications, stating age, qualifications, and experience, together with the names and addresses of 2 referees, to be sent to Hospital Secretary immediately.

ST. JAMES' HOSPITAL, Balham, London, S.W.12. South WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR. Post recognised for D.A. and F.F.A.R.C.S.

Application forms obtainable from Group Secretary, Wandsworth Hospital Group, at above address. (0617.)

ST. STEPHEN'S HOSPITAL, Fulham-road, Chelsea, S.W.10. (FLAxman 8161.) Locum Tenens SURGICAL REGISTRAR required immediately.

Please telephone Medical Superintendent.

ST. THOMAS'S HOSPITAL, London, S.E.1. Senior REGISTRAR to the E.N.T. Department. Whole-time or maximum part-time (9 sessions per week), for a period of 1 year in the first instance from 3rd March, 1958.

Applications, naming 2 referees, to the Clerk of the Governors by 25th October, 1957.

ST. THOMAS'S HOSPITAL, London, S.E.1. Clinical CHIEF ASSISTANT to the Radioactive Isotope Unit, from 1st January, 1958. Graded Senior Registrar (Supernumerary).

Applications, naming 2 referees, to the Clerk of the Governors by 25th October, 1957.

UNIVERSITY COLLEGE HOSPITAL, W.C.1. Applications are invited for 2 SURGICAL REGISTRAR appointments for 1 year in the first instance from date to be arranged. Preference will be given to candidates holding higher qualifications.

Applications, with the names of 2 referees, to Administrator and Secretary by 22nd October, 1957.

WANSTEAD HOSPITAL, Hermon Hill, London, E.11. (191 Beds.) HOUSE PHYSICIAN required. Post vacant 18th November, 1957.

Applications, with full details and copies of 2 recent testimonials, should be sent immediately to Secretary, Forest Group Hospital Management Committee, Langthorne-road, E.11.

ABERYSTWYTH, CARDIGANSHIRE. GENERAL HOSPITAL. • SENIOR HOUSE OFFICER (surgical) required immediately for Aberystwyth General Hospital. This post is resident and recognised for F.R.C.S. examination.

Applications to Group Secretary, Mid-Wales Hospital Management Committee, 31, North-parade, Aberystwyth, Cards.

ALTON GENERAL HOSPITAL. (136 Beds.) Senior HOUSE OFFICER (medical). Immediate vacancy. Resident. Candidate should have some experience of anæsthetics. There are 2 other resident Senior House Officers and 1 full-time Consultant Surgeon on the staff.

Applications, stating age, qualifications and experience, together with copies of 2 testimonials, to the Hospital Secretary.

ALTRINCHAM GENERAL HOSPITAL. Assistant Senior SURGICAL OFFICER (Junior Hospital Medical Officer grade). Applications are invited for this post in a hospital of 130 acute beds with a busy Casualty Department. The appointee would be required to exercise control of this department and also to assist Resident Surgical Officer with the general surgical work of the Hospital. The post offers excellent opportunities of practical experience and postgraduate study to suitably qualified candidates and particularly those studying for higher surgical qualifications.

Applications, with names of 2 referees, to Group Secretary, North and Mid-Cheshire Hospital Management Committee, Sinderland-road, Altrincham, Cheshire.

ASHFORD HOSPITAL, Ashford, Middlesex. (560 Beds.) STAINES GROUP HOSPITAL MANAGEMENT COMMITTEE. Required, RESIDENT HOUSE OFFICER for Special Department (E.N.T., pædiatrics, dermatology, &c.). 6 months appointment, vacant 6th November, 1957. Not suitable for pre-registration candidates, offers good experience before general practice.

Applications, stating age, qualifications and experience with copies of up to 3 recent testimonials, to Medical Director of Hospital.

ASHTON, HYDE AND GLOSSOP HOSPITAL MANAGEMENT COMMITTEE. 2 HOUSE SURGEONS required at Ashton-under-Lyne General Hospital. Preference will be given to pre-registration applicants. Recognised for F.R.C.S.(Eng.). 1 vacant end of October, 1 vacant middle of November.

Applications, with copies of 2 testimonials, to Group Secretary, General Hospital, Ashton-under-Lyne.

BARNSTAPLE. NORTH DEVON INFIRMARY. (105 Beds.) HOUSE SURGEON required ; recognised pre-registration appointment.

Applications to Group Secretary, 19, Alexandra-road, Barnstaple.

BANGOR. CAERNARVON AND ANGLESEY GENERAL HOSPITAL. Applications are invited for the post of HOUSE PHYSICIAN at the above Hospital. The appointment is for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Caernarvon and Anglesey Hospital Management Committee, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of the appearance of this advertisement.

BARROW-IN-FURNESS. NORTH LONSDALE HOSPITAL. Applications are invited for the resident post of HOUSE OFFICER (surgical) (recognised for pre-registration) at the above Hospital. Post available immediately. Recognised for F.R.C.S.

Applications to the Group Secretary, Barrow and Furness Hospital Management Committee, 105, Abbey-road, Barrow-in-Furness.

BEDFORD GENERAL HOSPITAL. (436 Beds.) Locum MEDICAL REGISTRAR required from 23rd October.

Applications to Group Secretary, Bedford Group Hospital Management Committee, 3, Kimbolton-road, Bedford (Tel. Bedford 5401).

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) Locum ORTHOPÆDIC HOUSE SURGEON (Senior House Officer or House Officer grading according to experience).

Applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 Beds.) HOUSE PHYSICIAN (House Officer or Senior House Officer grading according to experience).

Apply Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. ASSISTANT PATHOLOGIST (Senior House Officer grade) required for Area Laboratory. Offers experience in all branches of pathology.

Detailed applications to Group Secretary.

BEVERLEY, YORKSHIRE. WESTWOOD HOSPITAL. (229 acute beds.) ORTHOPÆDIC HOUSE SURGEON (first, second or third post), vacant now. Offers good opportunity for general experience in busy acute general hospital. Approved pre-registration post. Fully registered practitioners may apply. Recognised for F.R.C.S.

Apply Group Secretary.

BIRMINGHAM REGIONAL HOSPITAL BOARD.

(1) **Herefordshire Group, Victoria House, Eign-street, Hereford**

REGISTRAR (general surgery). Duties mainly at General (154 Beds—71 surgical beds, including fracture and orthopædic) and County Hospitals, Hereford (339 Beds—40 surgical). Recognised for F.R.C.S.

(2) **Dudley, Stourbridge Group, The Guest Hospital, Dudley**

REGISTRAR (general surgery) for The Guest Hospital. Experience specialty essential. Higher qualification desirable. Resident.

(3) **Birmingham (Sanatoria) Group, Yardley Green Hospital, Birmingham, 9**

REGISTRAR, Thoracic Surgical Unit (66 Beds), Yardley Green Hospital. Resident or non-resident. House may be available if married. Tuberculous and non-tuberculous surgery undertaken. Experience in general surgery essential.

(4) **Dudley Road Group, Dudley Road Hospital, Birmingham, 18**

REGISTRAR (pathology) (non-resident) for Dudley Road Hospital (780 Beds). Recognised for Dip.Path. Post offers wide experience in all branches.

(5) **Coventry No. 20 Group, Coventry and Warwickshire Hospital, Coventry**

REGISTRAR (orthopædic surgery) for Hospital of St. Cross, Rugby (156 Beds). Vacant November. Some experience of traumatic surgery essential. Recognised F.R.C.S. Married accommodation available if required.

Application forms from Group Secretaries to be returned by 21st October, 1957.

BRADFORD ROYAL INFIRMARY. (507 Beds.) Senior HOUSE SURGEON (Thoracic Unit), vacant now.

Applications, stating age, experience, nationality, and qualifications with copy testimonials, to the Secretary.

BRENTWOOD, ESSEX. WARLEY HOSPITAL. Senior HOUSE OFFICER required 1st December, 1957. The Hospital is situated within easy reach of London by main line electric service and bus. There are over 2000 Beds and a wide experience of all types of mental disorders (including the neuroses) can be obtained. All modern treatments are carried out, including psychosurgery. Visiting Consultants in other specialties attend regularly. Teaching by senior staff and facilities for attending postgraduate courses are provided; also experience of outpatient clinics. Regular clinical meetings are held. Library, private bedroom and individual sitting room are provided. Indoor and outdoor recreational facilities. The post may be non-resident. Salary at the rate of £819 10s. p.a., less a reasonable charge for residential emoluments.

Applications, stating age, experience and qualifications, should be sent to the Physician-Superintendent, with the names of 2 referees.

BRIGHTON AND LEWES HOSPITAL MANAGEMENT COMMITTEE. Vacancy for Whole-time (non-resident) Locum REGISTRAR in Pædiatrics from 25th October, 1957, to 30th November, 1957. Experience available at the Royal Alexandra Hospital for Sick Children, Sussex Maternity Hospital, Brighton General Hospital and Cuckfield Hospital, Mid-Sussex Group.

Further details available from Group Secretary, Brighton and Lewes Hospital Management Committee, Royal Sussex County Hospital, Eastern-road, Brighton, 7 (telephone: Brighton 29155), to whom application should be sent immediately.

BRIGHTON GENERAL HOSPITAL. Brighton and LEWES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the position of HOUSE PHYSICIAN to the Geriatric Unit. This is a large Unit with an active rehabilitation section, which provides excellent clinical facilities. Vacant 1st November.

Applications, stating age, qualifications, and experience, together with copies of recent testimonials, should be sent to the Physician-Superintendent, Brighton General Hospital, Elmgrove, Brighton, 7.

BRISTOL. COSSHAM AND FRENCHAY HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER required for the Department of Thoracic Surgery (120 Beds) at Frenchay Hospital.

Apply to Group Secretary, Frenchay Hospital, Bristol, giving age and experience and quoting 2 referees.

BROXBURN, WEST LOTHIAN. BANGOUR GENERAL HOSPITAL. (15 miles from Edinburgh.) Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Ophthalmic Unit (32 Beds) at Bangour General Hospital, Broxburn, which is associated with the Ophthalmic Unit of the Royal Infirmary, Edinburgh. Salary and conditions of service will be in accordance with the regulations.

Applications, giving age, qualifications, and particulars of previous experience, should be lodged with the Group Secretary and Treasurer, Board of Management, Bangour Hospital, Broxburn, West Lothian.

BISHOP AUCKLAND, co. DURHAM. THE GENERAL HOSPITAL. (350 Beds.) HOUSE SURGEON required. Recognised pre-registration appointment.

Apply, naming 2 referees, to K. G. T. LUXFORD, Group Secretary, South West Durham Hospital Management Committee, at the above address.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. (386 Beds.) SENIOR HOUSE OFFICER (surgical) required for general and orthopædic surgical duties. Salary £819 10s. p.a., less £150 in respect of residential emoluments.

Further particulars from, or applications with names of 2 referees to, the Hospital Secretary.

BISHOP'S STORTFORD, HERTFORDSHIRE. HERTS AND ESSEX GENERAL HOSPITAL. (386 Beds.) Applications are invited for the post of HOUSE OFFICER (surgical), pre-registration. Salary £467 10s.–£522 10s. p.a., less £125 in respect of residential emoluments. Appointment to commence immediately. There is a pre-registration medical post for which the successful candidate will receive consideration at the termination of the surgical appointment.

Applications, stating age, nationality, qualifications, and experience, with copies of 2 recent testimonials or the names of referees, to the Hospital Secretary.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. JUNIOR HOSPITAL MEDICAL OFFICER required mid-November for established Geriatric Department under control of Consultant Geriatrician. There are 360 geriatric beds at Queen's Park Hospital, Blackburn, Springfield Hospital, Blackburn, and Clitheroe Hospital, Clitheroe. Accommodation for married man may be available if required.

Applications, with names of 2 referees, to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BLACKBURN AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. SENIOR HOUSE OFFICER (pathology) required for duties at Royal Infirmary, Blackburn (Group Laboratory), but may also be required for duties at Queen's Park Hospital, Blackburn, and Victoria Hospital, Accrington, at Consultant's discretion. Recognised for D.Path. Post vacant now.

Applications, with names of 2 referees, to Group Secretary, Hospital Management Committee Office, Royal Infirmary, Blackburn.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. ROSSENDALE GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Obstetrics and Gynæcology.

Apply, stating full details and names of 2 referees, to Group Secretary, Bury General Hospital, Bury, Lancs.

BURY AND ROSSENDALE HOSPITAL MANAGEMENT COMMITTEE. BURY GENERAL HOSPITAL. Applications are invited for the post of SENIOR HOUSE OFFICER in Pædiatrics. The post is based upon Bury General Hospital but the successful applicant will also have duties at other hospitals in the Group. It is recognised for the examination for the D.C.H.

Apply, stating full details and names of 2 referees, to H. WILKINSON, Esq., Group Secretary, Bury General Hospital, Bury, Lancs, not later than 19th October, 1957.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, CHRISTCHURCH, HANTS. HOUSE PHYSICIAN (Pre-registration Intern) required for general medicine for post becoming vacant on 17th November, 1957, at the above Hospital of 334 Beds (including 79 acute medical, 34 pædiatric, 56 surgical, 6 chest diagnostic, and a geriatric ward). Duties also include attendance at outpatient clinics at the Royal Victoria Hospital, Boscombe.

Applications to the Hospital Secretary.

BOURNEMOUTH (near). CHRISTCHURCH HOSPITAL, HAMPSHIRE. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of HOUSE PHYSICIAN at the above Hospital of 334 Beds, including new Surgical Unit of 56 Beds, 79 acute medical, 34 pædiatric, 6 chest diagnostic and geriatric ward. Duties also include attendance at outpatient clinics at Roya' Victoria Hospital, Boscombe. The appointment, which is recognised for pre-registration purposes, becomes vacant on 4th November, 1957.

Applications, with copies of testimonials, to the Hospital Secretary.

BOURNEMOUTH. ROYAL VICTORIA HOSPITAL, Shelley-road. BOURNEMOUTH AND EAST DORSET HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of GENERAL HOUSE SURGEON. The appointment is recognised for the F.R.C.S. examination and for pre-registration purposes and becomes vacant on 21st November, 1957.

Applications to the Hospital Secretary.

CAERNARVON AND ANGLESEY HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for HOUSE SURGEONS at each of the following hospitals :—

LLANDUDNO GENERAL HOSPITAL, LLANDUDNO. (Recognised for F.R.C.S.)

CAERNARVON AND ANGLESEY GENERAL HOSPITAL, BANGOR. (Recognised for F.R.C.S.)

The appointments are for a period of 6 months. Salary and conditions of service in accordance with those approved by the Ministry of Health.

Applications, stating age, qualifications and experience, together with the names and addresses of 2 referees, to be forwarded to the Group Secretary, Plas Gwyn, Ffriddoedd-road, Bangor, within 10 days of the appearance of this advertisement.

CAERPHILLY HOSPITAL. (226 Beds for acute general medicine and surgery.) Pre-registration HOUSE OFFICER (orthopædics and general surgery) required at above Hospital.

Apply immediately, with names of referees, to the Group Secretary, Rhymney and Sirhowy Valleys Hospital Management Committee, Central Offices, Caerphilly-road, Ystrad Mynach, Glam.

CAMBRIDGE. THE UNITED CAMBRIDGE HOSPITALS. ADDENBROOKE'S HOSPITAL, CAMBRIDGE.

HOUSE PHYSICIAN for 6 months from 1st December. Recognised Pre-registration Service.

ANÆSTHETIC SENIOR HOUSE OFFICER (resident) for 1 year from 1st December. Anæsthetic experience essential.

Apply to the Secretary by 26th October, stating age, nationality, qualifications and experience with dates, and copies of 3 testimonials. Interviews early November.

CARDIFF. GLAN ELY TUBERCULOSIS HOSPITAL, FAIRWATER, CARDIFF. SENIOR HOUSE OFFICER (resident) required at above Hospital.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. ROYAL HAMADRYAD GENERAL AND SEAMEN'S HOSPITAL. CARDIFF HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SENIOR HOUSE OFFICER (medical) required at above Hospital, which caters for acute general medical and surgical cases. Hospital contains acute medical unit, general surgical and genito-urinary units and outpatient facilities, also certain amount of casualty work. Consultant Staff drawn mostly from United Cardiff Hospitals. Post for 1 year and presents facilities for postgraduate study.

Form of application from Group Secretary, Cardiff Hospital Management Committee, 44, Cathedral-road, Cardiff.

CARDIFF. UNITED CARDIFF HOSPITALS. Applications are invited for the post of MEDICAL REGISTRAR to the Miners' Chest Diseases Treatment Centre at Llandough Hospital, Penarth, Glam. The Centre caters for all types of chest diseases and it is closely associated with the adjoining Pneumoconiosis Research Unit of the Medical Research Council.

Application forms may be obtained from the Secretary to the Board at Cardiff Royal Infirmary, Cardiff, and should be returned not later than 26th October, 1957.

CARMARTHEN. WEST WALES GENERAL HOSPITAL. (188 Beds.) WEST WALES HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT SENIOR HOUSE OFFICER (surgical) (recognised by the Royal College of Surgeons), which is now vacant. Salary and conditions of service as laid down by the Ministry of Health.

Applications, stating age, qualifications, experience and nationality, with names and addresses of 3 referees, to the Group Secretary, West Wales Hospital Management Committee, Glangwili, Carmarthen.

CARSHALTON, SURREY. ST. HELIER HOSPITAL. HOUSE SURGEON (approved for Pre-registration Service). General surgery with duties in E.N.T. Vacant 14th November.

Applications, giving age, qualifications, &c., with copies of recent testimonials or the names and addresses of 2 referees, should be sent to the Secretary at above address.

CARSHALTON, SURREY. QUEEN MARY'S HOSPITAL FOR CHILDREN. (General Children's Hospital of 700 Beds.) HOUSE SURGEON (House Officer) (resident) required for 6 months (3 months general surgery, 3 months E.N.T. and orthopædics). Recognised for D.C.H. Applicants must have completed 12 months Pre-registration Service.

Applications, stating age and qualifications, together with 1 recent testimonial and the names of 2 referees, should be submitted to the Group Secretary, immediately.

CHATHAM, KENT. ALL SAINTS' HOSPITAL. Medway AND GRAVESEND HOSPITAL MANAGEMENT COMMITTEE. HOUSE SURGEON. Applications are invited for this post, vacant now, which is recognised for Pre-registration Service. Salary £467 10s. –£577 10s. p.a., according to experience.

Applications, stating age, qualifications, nationality and experience, together with copies of 3 recent testimonials, to be addressed to the Hospital Secretary.

CHELMSFORD. ST. JOHNS' HOSPITAL. (Recognised for M.R.C.O.G.) RESIDENT GYNÆCOLOGICAL HOUSE SURGEON. Appointment to commence as soon as possible. Preference will be given to candidates who intend to obtain the Diploma of Membership of the Royal College of Gynæcologists.

Applications, stating age, nationality, qualifications and experience, together with recent testimonials, should be sent immediately to the Secretary, Chelmsford Group Hospital Management Committee, Chelmsford and Essex Hospital, London-road, Chelmsford.

CHELMSFORD AND ESSEX HOSPITAL. (161 Beds.) Applications are invited for the post of RESIDENT HOUSE SURGEON. Pre-registration post. The post will become vacant during the middle of November, and offers good surgical experience. Recognised for the F.R.C.S.

Applications, together with 2 recent testimonials, to the Secretary, Chelmsford Hospital Management Committee, London-road, Chelmsford.

CHELMSFORD HOSPITAL MANAGEMENT COMMITTEE. Resident Locum Tenens REGISTRAR in Surgery required to work at the Chelmsford and Essex Hospital for period 26th October–8th November, inclusive.

Applications to the Secretary, London-road, Chelmsford.

CHERTSEY, SURREY. ST. PETER'S HOSPITAL (late Botley's Park War Hospital). (430 Beds.) ORTHOPÆDIC HOUSE SURGEON (Senior House Officer, or House Officer (Intern) grade). 100 orthopædic beds. Post recognised for F.R.C.S. and Pre-registration Service. Salary in accordance with terms and conditions of National Health Service. Post vacant 1st November, 1957.

Applications, together with names and addresses of referees, to be sent to the Physician-Superintendent, St. Peter's Hospital, Chertsey, as soon as possible.

COLCHESTER GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for :—

Essex County Hospital, Colchester, Essex (185 Beds)

Post of SENIOR HOUSE OFFICER to Casualty and E.N.T. Departments. Post tenable for 6 months or 1 year. Recognised for F.R.C.S.

Black Notley Hospital, Braintree, Essex (516 Beds)

Post of HOUSE OFFICER (orthopædic surgery). Duties include care of cases from London Hospital Orthopædic Department. First, second, third, or pre-registration post, tenable for 6 months. Recognised for F.R.C.S.

Applications, with copies of 3 testimonials, to Group Secretary, Colchester Hospital Management Committee, 14, Pope's-lane, Colchester, Essex.

CUCKFIELD HOSPITAL, Cuckfield, near Haywards HEATH. SENIOR HOUSE SURGEON (Orthopædic and Traumatic Unit). Post now vacant. Tenable 6 or 12 months.

Applications, giving age, nationality, qualifications and experience, and names of 2 referees, to Group Secretary, Mid-Sussex Hospital Management Committee.

DEWSBURY, YORKSHIRE. THE GENERAL HOSPITAL.

HOUSE OFFICER (surgery and E.N.T.).

HOUSE OFFICER (medicine and dermatology).

Applications are invited for the above posts which become vacant on 1st November. Both the appointments are recognised for pre-registration.

Applications, stating age and experience, and giving names and addresses of 2 referees, to the Administrative Officer at the Hospital.

DUDLEY, STOURBRIDGE AND DISTRICT HOSPITAL GROUP, BIRMINGHAM REGION.

The Guest Hospital, Dudley (154 Beds)

CLINICAL ASSISTANT in E.N.T. Surgery, to assist at Outpatient Department on Monday and Tuesday afternoons.

Applications, with references, to Group Secretary, Guest Hospital, Dudley.

SENIOR HOUSE OFFICER (anæsthetics). Post recognised for D.A. Successful candidate will be required to visit other hospitals in the Group.

Applications, giving the names of 2 referees, to the Group Secretary, Guest Hospital, Dudley, Worcs.

SENIOR HOUSE OFFICER (surgical). Post vacant November, 1957.

HOUSE OFFICER (surgical), pre-registration. Post vacant now.

Apply Group Secretary, Guest Hospital, Dudley, Worcs.

EAST ANGLIAN REGIONAL HOSPITAL BOARD. Locum SENIOR MEDICAL REGISTRAR, Ipswich and East Suffolk Hospital, Ipswich. Post available until end of February, 1958. Salary £26 8s. per week.

Applications, stating age and experience, to be sent to Group Secretary, Ipswich and East Suffolk Hospital, Anglesea-road, Ipswich.

EAST ANGLIAN REGIONAL HOSPITAL BOARD.

REGISTRARS (2) in Obstetrics and Gynæcology, Norfolk and Norwich Hospital Group. Main hospital Norfolk and Norwich (441 Beds). Recognised for D.Obst. R.C.O.G. and M.R.C.O.G. Appointment for 1 year, renewable for second year. Candidates are invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary, Norfolk and Norwich Hospital.

ANÆSTHETIC REGISTRAR, Peterborough Memorial Hospital and Annexes. Post recognised for D.A. and F.F.A.R.C.S. and provides experience in all departments including a Thoracic Unit. Appointment for 1 year, renewable for second year. Candidates are invited to visit the Hospital by direct arrangement with Hospital Management Committee Secretary, Memorial Hospital, Peterborough.

Applications, stating age, experience and the names of 3 referees, to the Board's Senior Administrative Medical Officer, 117, Chesterton-road, Cambridge, by 21st October, 1957.

EDGWARE GENERAL HOSPITAL. (715 Beds.) North WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT PÆDIATRIC REGISTRAR required at above Hospital—32 pædiatric beds. Department is also responsible for the supervision of 64 cots in Maternity Unit and 50 cots at Bushey Maternity Hospital. Post vacant 28th November, 1957. Hospital may be visited by direct appointment with Medical Director.

Application forms obtainable from, and returnable to Group Secretary, Edgware General Hospital, Edgware, Middlesex by 22nd October, 1957.

EDGWARE GENERAL HOSPITAL, Edgware, Middlesex. (702 Beds.) NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. SENIOR REGISTRAR in Anæsthetics. Regional Training Scheme includes facilities for gaining experience in specialist techniques at regional centres for plastic, thoracic and neurosurgery. Hospital may be visited by direct appointment.

Application forms obtainable from, and returnable to, Group Secretary, Hendon Group Hospital Management Committee, Edgware General Hospital, by 22nd October, 1957.

EXETER. ROYAL DEVON AND EXETER HOSPITAL. Applications are invited from pre-registration and registered medical practitioners for the appointment of HOUSE PHYSICIAN (general medicine and pædiatrics), vacant 23rd November, 1957. The post is recognised under the regulations for the Diploma in Child Health.

Applications, with copies of 2 recent testimonials, to the Hospital Secretary by 19th October, 1957.

FARNBOROUGH HOSPITAL, Kent. (800 Beds.) 2 House SURGEONS required, 1 from 1st and 1 from 14th December. Recognised for F.R.C.S. Pre-registration posts.

Apply, stating age, qualifications with dates, and experience, and naming 3 referees, to Administrative Officer, quoting ref. H.S.

GLASGOW VICTORIA HOSPITALS BOARD OF MANAGEMENT AND THE EXECUTIVE COUNCIL FOR THE CITY OF GLASGOW. Applications are invited for 2 joint appointments as Part-time SENIOR HOUSE OFFICER in General Medicine at the Victoria Infirmary, Glasgow, and Part-time trainee General Practitioner. The appointments will be for 2 years and the successful applicants will spend part of each day in the general medical work of the Victoria Infirmary and part as a trainee general practitioner with a selected principal. The salary for the posts will be £819 10s. for the first year and £850 for the second year. A car allowance may be payable in addition.

Applications, with names of 2 referees, should be sent to the Secretary and Treasurer, Board of Management for Glasgow Victoria Hospitals, 24, St. Vincent-place, Glasgow, C.1, not later than 31st October, 1957.

GLOUCESTERSHIRE ROYAL HOSPITAL, Southgate-street, GLOUCESTER. 2 HOUSE SURGEONS required. Posts vacant end October. Excellent general surgical experience. Both posts recognised for Pre-registration Service and the F.R.C.S. examination.

Applications, naming 2 referees, to Deputy Group Secretary.

GUILDFORD GROUP HOSPITAL MANAGEMENT COMMITTEE. SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for the post of ANÆSTHETIC REGISTRAR (resident or non-resident) at St. Luke's Hospital, Guildford. The posts include duties at both St. Luke's and Royal Surrey County Hospitals. Preference given to candidates holding higher certificates. The post is recognised for D.A. and F.F.A.R.C.S. Candidates may visit the Hospital by appointment with the Physician-Superintendent.

Application forms obtainable from, and should be returned to, Group Secretary, Guildford Group Hospital Management Committee, St. Luke's Hospital, Guildford, by 2nd November, 1957.

HUDDERSFIELD ROYAL INFIRMARY. Huddersfield HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from provisionally registered medical practitioners for the post of HOUSE SURGEON to the Princess Royal Maternity Home (57 Beds), to commence duty on 1st December, 1957. The holder of the post, which is recognised for the D.Obst.R.C.O.G., will have access to the abnormal maternity and gynæcological beds at The Royal Infirmary. The Department is under the control of 2 Consultant Obstetricians and Gynæcologists. Salary in accordance with national scale.

Applications, with copies of 3 recent testimonials, to be addressed to—

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HUDDERSFIELD. ST. LUKE'S HOSPITAL. (235 Beds.) HUDDERSFIELD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of RESIDENT MEDICAL OFFICER (Senior House Officer grade) at the above Hospital, to commence duties immediately. The Hospital caters for chronic sick, children, maternity and acute medical and surgical patients. Salary, in accordance with the terms and conditions of service for hospital medical and dental staffs, £819 10s. p.a.

Applications, together with copies of 3 recent testimonials, to be sent to the undersigned as soon as possible.

H. J. JOHNSON, Secretary to the Management Committee.
The Royal Infirmary, Huddersfield.

HERTFORD COUNTY HOSPITAL. (173 Beds. Hospital situated 21 miles from London.) RESIDENT CASUALTY OFFICER (Senior House Officer grade) with attachment to Pædiatrician and Ophthalmic Consultant. Salary £819 10s. p.a., less £150 p.a. residential emoluments. Recognised under F.R.C.S. regulations. Appointment to commence as soon as possible.

Apply, with full details and references, to Group Secretary, Hertford Hospital Management Committee, County Hospital, Hertford, Herts.

HEMEL HEMPSTEAD, HERTFORDSHIRE. ST. PAUL'S HOSPITAL. HOUSE PHYSICIAN (pre-registration) required as from 17th October.

Applications to the Hospital Secretary, together with 2 copies of testimonials, or names of 2 referees.

HEMEL HEMPSTEAD. WEST HERTS HOSPITAL. NORTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. ANÆSTHETIC REGISTRAR required at above Hospital. New post. Application made for recognition by Faculty.

Application forms obtainable from, and returnable to, Secretary, West Herts Group Hospital Management Committee, 9, Rickmansworth-road, Watford, Herts, by not later than 10 days after the appearance of this advertisement.

HEMEL HEMPSTEAD, HERTFORDSHIRE. WEST HERTS HOSPITAL. Locum Tenens HOUSE SURGEON required for the period 28th October–16th November, inclusive.

Applications, together with copies of 2 recent testimonials, should be sent to the Hospital Secretary as soon as possible.

HALIFAX. NORTHOWRAM HALL HOSPITAL. (108 Beds.) SENIOR HOUSE OFFICER in Chest Diseases required. Post vacant now. Duties include attendance at busy Chest Clinic, at the Royal Halifax Infirmary, and non-tuberculosis chest ward work. This post offers excellent facilities for a study of chest diseases and experience is available with bronchoscopies and bronchograms. Salary £819 10s. p.a., with a deduction of £150 p.a. for board, residence, &c.

Applications to be forwarded to the Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ROYAL HALIFAX INFIRMARY. House PHYSICIAN in General Medicine required. Post vacant 1st November, 1957.

Apply to Group Secretary, Royal Halifax Infirmary, Halifax.

HALIFAX. ST. JOHN'S HOSPITAL. (382 Beds.) Senior HOUSE OFFICER in Geriatrics and General Medicine required. Post vacant 16th October, 1957. Salary £819 10s. p.a., with deduction of £150 p.a. for board-residence, &c.

Applications to the Group Secretary, Royal Halifax Infirmary, Halifax.

ILFORD. KING GEORGE HOSPITAL, Eastern-avenue. There will be a vacancy for a HOUSE SURGEON at above Hospital. First or second post pre-registration, to commence on 13th November, 1957. This post will be tenable for 6 months.

Applications, giving full particulars and accompanied by testimonials, should be sent to the undersigned within 7 days of the appearance of this advertisement.

H. F. HARRIS, Group Secretary.
Ilford and Barking Group Hospital Management Committee.

ILKLEY. MIDDLETON HOSPITAL. (430 Beds.) RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER required at the above Hospital. This appointment provides for experience in the specialties of tuberculosis and geriatrics.

Applications, stating age, nationality, qualifications and experience, to Hospital Secretary.

IPSWICH AND EAST SUFFOLK HOSPITAL. Anglesea ROAD WING. (356 Beds.) Applications are invited for the post of SENIOR HOUSE SURGEON to the Fracture and Orthopædic Department. The post is graded Senior House Officer and is recognised for the F.R.C.S. examinations. The Department has 2 Consultants, about 60 Beds and a large outpatient attendance; it offers wide experience.

Applications, stating age, nationality and experience together with copies of recent testimonials to the Hospital Secretary.

ISLEWORTH. WEST MIDDLESEX HOSPITAL. House OFFICER (Geriatric Unit), resident. Post offers excellent experience in general medicine.

Applications, stating age, qualifications and copies of up to 3 testimonials or names of referees, to Group Secretary, South West Middlesex Hospital Management Committee, West Middlesex Hospital, Isleworth, by 22nd October.

KEIGHLEY AND DISTRICT VICTORIA HOSPITAL, KEIGHLEY, YORKS. (General—139 Beds.) 2 RESIDENT HOUSE SURGEONS (either sex).

General surgery and E.N.T., vacant 1st November.

General surgery and orthopædics, vacant 1st November.

Both recognised for F.R.C.S. and approved pre-registration appointments, tenable for 6 months in first instance. 4 residents on staff.

Applications, with full particulars as to age, nationality, and qualifications, and copies of 2 testimonials, to Group Secretary, St. John's Hospital, Keighley, Yorks.

KETTERING GENERAL HOSPITAL, Kettering. (130 Beds.) KETTERING AND DISTRICT HOSPITAL MANAGEMENT COMMITTEE. Applications are invited from registered medical practitioners for the appointment of SENIOR HOUSE OFFICER in Anæsthetics. Post vacant now. Post recognised for D.A.

Applications, giving details of qualifications and experience, and enclosing copies of 3 recent testimonials, to be sent to the Group Secretary at the above address.

KIDDERMINSTER AND DISTRICT GENERAL HOSPITAL. (112 Beds.) Applications are invited for the pre-registration post of HOUSE SURGEON at the above Hospital. Post vacant shortly.

Applications, with the names of 3 referees, to the Hospital Secretary.

LANCASTER MOOR HOSPITAL, Lancaster. Regional Mental Hospital. Applications are invited for the post of RESIDENT JUNIOR HOSPITAL MEDICAL OFFICER (Male or Female). Unfurnished house available; furnished quarters for married couple (without children) or single person. Hospital recognised for D.P.M. and facilities granted for attending neighbouring universities. All modern methods of investigation and treatment carried out. Hospital serving N. Lancashire and Lake District. Post for initial period of 4 years, but renewable if services satisfactory.

Apply Medical Superintendent.

LEAMINGTON SPA. WARNEFORD GENERAL HOSPITAL. (197 Beds.) RESIDENT HOUSE SURGEON (general surgery). Post vacant. Recognised for pre-registration and F.R.C.S. Post provides excellent experience. Good accommodation available.

Applications, with 2 recent testimonials, to Hospital Secretary.

LEICESTER ROYAL INFIRMARY. (492 Beds. Recognised for training for F.R.C.S.) **SHEFFIELD REGIONAL HOSPITAL BOARD.** Whole-time RESIDENT SURGICAL REGISTRAR required. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st October, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

LEICESTER ROYAL INFIRMARY. Applications are invited for the post of SENIOR HOUSE OFFICER/INTERN in Surgical Department, now vacant. Recognised for F.R.C.S.

Applications, stating age, qualifications and experience, together with copies of recent testimonials, to Group Secretary, No. 1 Hospital Management Committee, The Leicester Royal Infirmary, immediately.

LEICESTER. TOWERS MENTAL HOSPITAL. (1168 Beds.) Applications are invited for the whole-time post of JUNIOR HOSPITAL MEDICAL OFFICER. Salary £852 10s.–£55–£1182 10s. There is ample opportunity for experience in all branches of psychiatry including outpatient work and the Hospital is recognised for D.P.M. experience. Facilities for post-graduate training exist at Sheffield University. Resident accommodation is available for a single man, for which the appropriate charge will be made. Candidates must have completed their service with H.M. Forces.

Applications, giving age, nationality, and full details with the names of 2 referees, to be sent to the Medical Superintendent as soon as possible.

LEEDS. THE UNITED LEEDS HOSPITALS. The GENERAL INFIRMARY AT LEEDS. SENIOR REGISTRAR in Diagnostic Radiology required for 1 year in the first instance; appointment renewable thereafter. Diploma in Radiology essential and other higher qualification desirable. Terms and conditions of service for hospital medical staff apply.

Applications, giving details of age, education, qualifications, and previous posts with dates, and 3 names for reference, should be sent to the Sub-Dean, School of Medicine, Leeds, 2, before 23rd October, 1957.

LEEDS REGIONAL HOSPITAL BOARD. Registrar vacancies.

General Surgery

Clayton Hospital, Wakefield (75 general surgical beds). Duties are those of Resident Surgical Officer, married quarters available. Recognised for F.R.C.S., may include some duties in the Casualty Department.

Obstetrics and Gynæcology

St. Luke's Hospital, Bradford (118 obstetric and 105 gynæcological beds). New post awaiting recognition for M.R.C.O.G. Resident.

Applications, stating age, qualifications, and details of present and previous appointments with dates, together with the names and addresses of 3 referees, to the Secretary, Joint Registrars Committee, Park-parade, Harrogate, by 23rd October, 1957.

LIVERPOOL, 14. BROADGREEN HOSPITAL. Applications are invited for appointment as SENIOR HOUSE OFFICER (resident) in the Thoracic Surgical Unit. The post is tenable for 6 months from 1st December next. Salary £819 10s. p.a., less £150 p.a. for board and lodging.

Applications, on forms obtainable from the undersigned, to be returned completed not later than 19th October, 1957.

H. BLYTHE, Group Secretary.

LLANELLY HOSPITAL, Llanelly. (164 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the appointment of SENIOR HOUSE OFFICER in the Casualty Department of the above Hospital.

Full particulars, stating age, experience and qualifications, together with copies of 2 recent testimonials should be forwarded to the Hospital Secretary. T. E. JONES, Group Secretary.

LLANELLY HOSPITAL, Llanelly. (164 Beds.) Glantawe HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics at above Hospital. The Hospital is recognised for the D.A. examination. The successful candidate will be granted facilities to attend monthly anæsthetic lectures and discussions which are held at the Cardiff Royal Infirmary.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be sent to the Secretary of the Hospital. T. E. JONES, Group Secretary.

LLWYNYPIA HOSPITAL, Llwynypia, Rhondda. (213 Beds including acute medical and chronic sick beds.) HOUSE OFFICER (medical). Person appointed will also undertake duties at the Group Infectious Diseases Hospital when required.

Applications, stating age, qualifications, and experience, together with copies of 2 recent testimonials, to be sent to the Group Secretary, Pontypridd and Rhondda Hospital Management Committee, Courthouse-street, Pontypridd.

LUTON AND DUNSTABLE HOSPITAL, Luton, Bedfordshire. Locum ANÆSTHETIC REGISTRAR required until permanent appointment is made.

Applications, giving full particulars and names of referees, to Secretary, Luton and Dunstable Hospital, Luton, Beds.

MACCLESFIELD HOSPITAL. (301 Beds.) **Vacancy**—SENIOR HOUSE OFFICER in Medicine. Department has 56 acute beds together with some chronic sick beds; excellent opportunities available for gaining valuable experience.

Apply immediately, with full particulars and names of 2 referees, to Group Secretary, Macclesfield and District Hospital Management Committee, "Willerby House," Cumberland-street, Macclesfield.

MARKET DRAYTON, SHROPSHIRE, CHESHIRE JOINT SANATORIUM. SENIOR HOUSE OFFICER required for inpatient and outpatient duties with Thoracic Surgical Unit dealing with tuberculous and non-tuberculous cases for a population of approximately 500,000.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

MANCHESTER REGIONAL HOSPITAL BOARD. Salford HOSPITAL MANAGEMENT COMMITTEE. SALFORD ROYAL HOSPITAL. Applications invited for the post of REGISTRAR (Urological Department), vacant 1st November, 1957. The post offers wide experience in all branches of urology.

Applications to Group Secretary, Salford Royal Hospital, Salford, 3, before 19th October, 1957.

MANCHESTER REGIONAL HOSPITAL BOARD. North AND MID-CHESHIRE HOSPITAL MANAGEMENT COMMITTEE. REGISTRAR (chest diseases) required to carry out duties arranged by the Consultant Chest Physician at the Altrincham, Northwich, Crewe Chest Clinics and Hefferstone Grange Sanatorium, to commence November, 1957. Accommodation might be arranged, if necessary.

Applications, together with 2 recent testimonials, should be sent to the Group Secretary, North and Mid-Cheshire Hospital Management Committee, The Hospital, Sinderland-road, Altrincham, Cheshire.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) HOUSE OFFICER (general surgery) required. Pre-registration. Post recognised for F.R.C.S. examination. Post now vacant.

Application form from Secretary.

MANCHESTER. WEST MANCHESTER HOSPITAL MANAGEMENT COMMITTEE. PARK HOSPITAL, DAVYHULME. (General Hospital—433 Beds.) SENIOR HOUSE OFFICER (general surgery) required. Post vacant end November.

Application forms from Secretary.

MANCHESTER, 4. ANCOATS HOSPITAL. Applications are invited for the post of CASUALTY OFFICER (Senior House Officer). Recognised for F.R.C.S. Vacant 19th November, 1957.

Applications, with names of 2 referees, by 21st October, 1957, to Group Secretary, North Manchester Hospital Management Committee, Crumpsall Hospital, Manchester, 8.

MAIDSTONE. PRESTON HALL HOSPITAL, British LEGION VILLAGE, MAIDSTONE, KENT. Applications are invited for the post of JUNIOR HOSPITAL MEDICAL OFFICER at the above Hospital, which contains 330 Beds for treatment of pulmonary tuberculosis and other chest diseases, and includes a major Thoracic Surgical Unit. Candidates should have had experience in general medicine and in the treatment of chest diseases in adults. Salary £852 10s.–£55–£1182 10s. p.a. National scale and conditions. Married accommodation available shortly.

Applications, stating age, qualifications and experience with relevant dates, together with names and addresses of 2 referees, to be sent to the Group Secretary by 25th October, 1957.

NEWCASTLE REGIONAL HOSPITAL BOARD. REGISTRAR PHYSICIAN (whole-time) for the Darlington Group of hospitals—main hospital—Darlington Memorial (208 Beds). Single accommodation available.

Applications, with name and addresses of 3 referees, to Senior Administrative Medical Officer, Regional Hospital Board, Benfield-road, Newcastle upon Tyne, 6, within 14 days.

NOTTINGHAM GENERAL HOSPITAL. (441 Beds. Recognised for training for F.R.C.S.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time RESIDENT or NON-RESIDENT ORTHOPÆDIC AND FRACTURE REGISTRAR required. The post offers exceptional experience in traumatic surgery. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st October, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

OTLEY, YORKSHIRE. THE GENERAL HOSPITAL. (172 Beds.). SENIOR HOUSE SURGEON (Senior House Officer grade) in General and Orthopædic Surgery (with secondary duties to other specialties) required to work under full Consultant staff who are members of the Teaching Staff of Leeds University. Post recognised under F.R.C.S. regulations.

Applications, stating age, nationality, and experience, with names of 2 referees, to Group Secretary, The General Hospital, Otley.

PLYMOUTH. SOUTH DEVON AND EAST CORNWALL HOSPITAL.

SENIOR HOUSE OFFICER, vacant 1st December, 1957. Devonport Hospital. Recognised for the F.R.C.S.

Applications to the Group Secretary, 7, Nelson-gardens, Devonport.

HOUSE SURGEON (pre-registration post), vacant 2nd November, 1957. Devonport Hospital. Recognised for the F.R.C.S.

Applications to the Group Secretary, 7, Nelson-gardens, Devonport.

HOUSE PHYSICIAN (pre-registration post), vacant 1st January, 1958.

Applications to the Group Secretary, Greenbank Road Hospital, Plymouth.

HOUSE SURGEONS (pre-registration posts), vacancies 9th December, 1957, 1st and 4th January, 1958. Recognised for the F.R.C.S.

Applications to the Group Secretary, Greenbank Road Hospital, Plymouth.

PÆDIATRIC HOUSE PHYSICIAN (pre-registration post), vacant 1st January, 1958. Recognised for the D.C.H.

Applications to the Group Secretary, Freedom Fields Hospital, Plymouth.

In all cases send names of 3 referees.

PORTSMOUTH GROUP HOSPITAL MANAGEMENT COMMITTEE.

(i) **Infectious Diseases Hospital**

SENIOR HOUSE OFFICER required with duties also on the Tuberculosis Wards and the Poliomyelitis Diagnostic and Respiratory Centre. Vacant now.

(ii) **Royal Portsmouth Hospital**

Orthopædic Department (104 Beds)

HOUSE OFFICER (pre-registration), vacant 1st November, 1957.

Applications, stating age, experience and qualifications, together with the names of 2 referees, should be forwarded as soon as possible to E. H. HURST.

St. Mary's Hospital, Milton-road, Portsmouth.

PONTEFRACT GENERAL INFIRMARY. House Surgeon required. This is an approved pre-registration post under Medical Act, 1950, but applications will be considered from fully registered practitioners. Hospital approved under F.R.C.S. regulations and provides excellent surgical experience. Post vacant 31st October, 1957.

Applications to the Secretary, Pontefract and Castleford Hospital Management Committee, Great Northern House, Salter-row, Pontefract, Yorkshire, as soon as possible.

READING. BATTLE HOSPITAL. (391 Beds.) Applications are invited from registered medical practitioners for the post of RESIDENT JUNIOR HOUSE SURGEON in the Accident and Orthopædic Department. Post vacant 1st November, 1957. F.R.C.S. recognised. Also casualty duties.

Apply, stating age, qualifications with dates, nationality, present post, with 1 copy of recent testimonial, to Hospital Secretary.

RHYL. ROYAL ALEXANDRA HOSPITAL. (138 Beds.) Applications are invited from pre-registration or registered medical practitioners for the post of HOUSE PHYSICIAN for the Departments of Medicine and Pædiatrics at the above Hospital. Post vacant 1st November, 1957.

Applications, with 2 testimonials, to be sent immediately to Group Secretary, Clwyd and Deeside Hospital Management Committee, "Rhianfa," Russell-road, Rhyl.

ROCHFORD GENERAL HOSPITAL, Rochford, Essex. Locum HOUSE OFFICER required for the Obstetric Unit, General Hospital, Rochford, for the period 21st October–3rd November, 1957, inclusive.

Apply to the undersigned as soon as possible.

J. C. FIELD, Secretary.

ROMFORD, ESSEX. OLDCHURCH HOSPITAL. (722 Beds.) RESIDENT HOUSE SURGEONS (2) required from 1st December, 1957, in the General Surgical Unit. Recognised for F.R.C.S. Open to either pre-registration applicants or to fully qualified practitioners. This very active unit of a total of approximately 180 Beds affords ample opportunities for candidates to obtain first-class tuition and experience. The candidates appointed will be attached to a unit of approximately 60 Beds.

Applications should be forwarded to the Group Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

ROMFORD, ESSEX. VICTORIA HOSPITAL. (99 Beds.) RESIDENT HOUSE PHYSICIAN (Male) required immediately. Not pre-registration appointment.

Applications should be forwarded to the Secretary, Romford Group Hospital Management Committee, Oldchurch Hospital, Romford.

SHEFFIELD. CITY GENERAL HOSPITAL. (652 Beds. Recognised for training for F.R.C.S. examination.) SHEFFIELD REGIONAL HOSPITAL BOARD. Whole-time NON-RESIDENT REGISTRAR (orthopædics) required immediately. Appointment for 1 year in first instance.

Apply to Secretary, Sheffield Regional Hospital Board, Old Fulwood-road, Sheffield, by 21st October, 1957, giving age, nationality, qualifications, present and previous appointments with dates, naming 3 referees.

SHEFFIELD. CITY GENERAL HOSPITAL. (Recognised for M.R.C.O.G.) Applications are invited for the resident post of SENIOR HOUSE OFFICER (gynæcology). Duties divided between units in charge of Professor of Obstetrics and Gynæcology, University of Sheffield, and full-time Consultant respectively.

Apply, giving full details of age, nationality, qualifications, present and previous appointments with dates, and the names of 2 persons for reference, to the Group Secretary, Nether Edge Hospital, Sheffield, 11.

SHEFFIELD. THE UNITED SHEFFIELD HOSPITALS. Applications are invited for the post of SURGICAL REGISTRAR. Post vacant 1st January, 1958. The successful candidate will work on a rotation basis between the Royal Infirmary and the Children's Hospital. It is intended, if possible, that the holder of the post will spend equal periods in the Orthopædic Department and on each of the 2 surgical firms at the Royal Infirmary: and for a period at the Children's Hospital.

Applications, stating age, qualifications and experience, with the names of 3 referees, should be sent not later than 19th October, 1957, to the Chief Administrative Officer, The United Sheffield Hospitals, West-street, Sheffield, 1.

SALFORD. LADYWELL HOSPITAL. (Geriatric Unit—188 Beds.) SALFORD HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for post of JUNIOR HOSPITAL MEDICAL OFFICER for active Geriatric Unit with full diagnostic and therapeutic facilities. Previous experience in this specialty is desirable, but not essential. The post is tenable for a maximum period of 4 years. Salary and deduction for the cost of board-residence in accordance with scale.

Applications, stating age, qualifications, and experience, together with names of 2 referees, should be submitted immediately to Hospital Secretary, Ladywell Hospital, Salford, 5, Lancs.

SCOTLAND. EASTERN REGIONAL HOSPITAL BOARD. DUNDEE AREA. Thoracic (and cardiac) surgery. Applications are invited for the appointment of REGISTRAR in Surgery for duty in the Regional Thoracic Surgical Centre at Ashludie Hospital, Monifieth, by Dundee (222 Beds—60 for thoracic surgery), and, in the Cardiovascular Department of the Professorial Surgical Unit at Dundee Royal Infirmary (the principal general teaching hospital associated with the University of St. Andrews—534 Beds). Previous experience in thoracic surgery and in general chest medicine an advantage. Salary and conditions of service in accordance with national agreement.

Further particulars and forms of application from the Secretary to the Board, 430, Blackness-road, Dundee, with whom applications must be lodged not later than 26th October, 1957.

SCOTLAND. SOUTH-EASTERN REGIONAL HOSPITAL BOARD. REGISTRAR in Medicine at the Royal Infirmary of Edinburgh, for duties in the Cardiological Unit.

Apply, giving particulars of age, qualifications and previous experience, and the names of 2 referees, to the Secretary, 11, Drumsheugh-gardens, Edinburgh, 3, by 2nd November, 1957.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. SENIOR HOUSE OFFICER (casualty) required, working with Casualty Registrar in busy Casualty Department. Post recognised for F.R.C.S. Experience given in plastic and orthopædic cases.

Applications, with names of 2 referees, to Secretary.

SLOUGH, BUCKINGHAMSHIRE. UPTON HOSPITAL. Locum SENIOR HOUSE OFFICER (casualty) required, working with Casualty Registrar in busy Casualty Department. Post recognised for F.R.C.S. Experience given in plastic and orthopædic cases.

Applications, with names of 2 referees, to Secretary.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds.) RESIDENT HOUSE PHYSICIAN required. Pre-registration candidates eligible.

Applications, with copies of testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton, as soon as possible.

SOUTHAMPTON. ROYAL SOUTH HANTS HOSPITAL. (274 Beds.) RESIDENT HOUSE SURGEON required. Pre-registration candidates eligible.

Applications, with copies of recent testimonials, should be forwarded to Group Secretary, Southampton Group Hospital Management Committee, Bullar-street, Southampton.

SOUTH WEST METROPOLITAN REGIONAL HOSPITAL BOARD. Psychiatric Registrars Training Scheme. Applications are invited for the appointment of REGISTRAR, with effect from 1st January, 1958, for 6 months periods at the Hospitals Knowle, Fareham; Coldeast, Sarisbury, near Southampton; St. James', Portsmouth; and Moorgreen, Southampton, in succession. These appointments afford wide experience in the treatment of all forms of nervous and mental disorder, including cases admitted to the observation ward at Moorgreen Hospital, and in mental deficiency. In addition there are special opportunities for experience in the Department of Child Psychiatry (inpatients and outpatients), in electroencephalography and in neurology at St. James' Hospital. Salary, &c., in accordance with the agreed terms and conditions of service for hospital medical staff. For residents the appropriate charges are made for full residential amenities. Candidates may visit the hospitals by appointment with the Physician-Superintendent.

Application forms may be obtained from the Group Secretary, Knowle Hospital, Fareham, Hants, to whom 5 copies should be sent within 2 weeks of the appearance of this advertisement.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for a whole-time appointment as ANÆSTHETIST (second year Registrar) to fill a vacancy in the approved establishment at Eastbourne Group of hospitals. The salary will be £1061 10s. p.a. and the appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales) and will be for 1 year in the first instance, renewable for a further year.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, W.1, not later than 26th October, 1957.

SOUTH EAST METROPOLITAN REGIONAL HOSPITAL BOARD. Applications are invited for an appointment as Whole-time REGISTRAR in Psychiatry to fill a vacancy in the approved trainee establishment at Oakwood Hospital, Maidstone, Kent. Previous experience in general medicine is desirable. The appointment will be in accordance with the terms and conditions of service of hospital medical and dental staffs (England and Wales), and will be for 1 year in the first instance.

Applications, giving particulars of age, qualifications and experience with relevant dates, together with the names and addresses of 2 referees, to be sent to the Secretary, Registrars Committee, South East Metropolitan Regional Hospital Board, 11, Portland-place, London, W.1, not later than 26th October, 1957.

STOKE-ON-TRENT. NORTH STAFFORDSHIRE ROYAL INFIRMARY. SENIOR HOUSE OFFICER (anæsthetics) required. Post vacant shortly. Recognised for F.F.A.R.C.S. and D.A.

Applications, with copy testimonials, to Group Secretary, Hospital Management Committee, Princes-road, Stoke-on-Trent, as soon as possible.

ST. ALBANS CITY HOSPITAL, St. Albans, Hertfordshire. (384 Beds.) Locum Tenens SURGICAL REGISTRAR (resident) required for 1 of the 2 surgical teams from 20th October, 1957, for an indefinite period.

Applications to Secretary, Mid Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts.

ST. ALBANS, HERTFORDSHIRE. HILL END HOSPITAL. (709 Beds. For Mental and Nervous Disorders.) Locum Tenens REGISTRAR in Psychiatry required from 11th October, 1957, for an indefinite period.

Applications to Secretary, Mid-Herts Group Hospital Management Committee, Bleak House, Catherine-street, St. Albans, Herts.

SHREWSBURY. EYE, EAR AND THROAT HOSPITAL. SENIOR HOUSE OFFICER (E.N.T.). Duties at E.N.T. Hospital (68 Beds) and Copthorne Hospital (168 Beds). Post recognised for the D.L.O.R.C.S. Vacant 1st November, 1957.

Applications, with copy testimonials, to the Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE SURGEON, vacant 1st November, 1957. Pre-registration candidates eligible. Recognised for the F.R.C.S.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SHREWSBURY. ROYAL SALOP INFIRMARY/COPTHORNE HOSPITAL. (500 Beds.) HOUSE PHYSICIAN. Pre-registration candidates eligible. Vacant 24th October, 1957.

Applications, with copy testimonials, to Group Secretary, Shrewsbury Hospital Group, Royal Salop Infirmary, Shrewsbury.

SKIPTON (near). GRASSINGTON HOSPITAL. (208 Beds.) SENIOR HOUSE OFFICER required for the above Hospital, which provides treatment for tuberculous patients, men and women. Accommodation available for single applicants.

Applications to Medical Superintendent.

SOUTHEND GENERAL HOSPITAL. (262 Beds.) Applications are invited for the post of HOUSE PHYSICIAN (pre-registration). Post vacant 18th November, 1957.

Applications, stating age, qualifications, experience, &c., together with copies of recent testimonials, should reach the undersigned at the Hospital by 17th October, 1957.

J. C. FIELD, Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. HOUSE PHYSICIAN required for post vacant 24th November. Pre-registration post.

Applications, stating age, experience, and qualifications with dates, with copies of 2 testimonials, to Secretary.

TAPLOW, near MAIDENHEAD. CANADIAN RED CROSS MEMORIAL HOSPITAL. SENIOR HOUSE OFFICER (anæsthetics) required. Post, which is tenable for 1 year, will be resident.

Applications, with names of 2 referees, to Secretary.

TAUNTON AND SOMERSET HOSPITAL. (423 Beds.) Applications are invited for a HOUSE PHYSICIAN (pre-registration post) recognised for F.R.C.S., vacant early November.

Applications, stating age, nationality, qualifications, and the names of 2 referees, to the Group Secretary, Taunton Hospital Management Committee, c/o Musgrove Park Hospital, Taunton.

TORQUAY. TORBAY HOSPITAL. Resident Senior HOUSE OFFICER (surgery) required immediately. Post recognised for F.R.C.S. There is a complement of 6 Resident House Officers.

Applications, stating qualifications, age, nationality, with copy testimonials (quoting Ref. F.955/83), to the Group Secretary, Torquay District Hospital Management Committee, Torbay Hospital, Torquay, S. Devon.

TREDEGAR GENERAL HOSPITAL, Monmouthshire. RHYMNEY AND SIRHOWY VALLEYS HOSPITAL MANAGEMENT COMMITTEE. RESIDENT SURGICAL OFFICER (Junior Hospital Medical Officer grade) required for Surgical Unit at above Hospital. Duties are those of Assistant to General Surgeon; staff includes also House Surgeon. Commodious family flat.

Apply, with full particulars and stating names of 2 referees, to Secretary.

TUNBRIDGE WELLS (near). PEMBURY HOSPITAL, PEMBURY. Applications are invited for the appointment of SENIOR ORTHOPÆDIC HOUSE SURGEON AND CASUALTY OFFICER (Senior House Officer grade) to begin duties as soon as possible. Recognised F.R.C.S. (Eng.) and tenable for 1 year. Work includes treatment of long and short stay cases and traumatic surgery with large outpatient and fracture clinics under 2 Consultants.

Apply, stating age, qualifications, and experience, together with 3 testimonials, to Group Secretary, Sherwood Park, Pembury-road, Tunbridge Wells.

WAKEFIELD. PINDERFIELDS GENERAL HOSPITAL. Applications invited from registered medical practitioners for post of JUNIOR HOSPITAL MEDICAL OFFICER in Anæsthetics (recognised for D.A. and F.F.A.R.C.S.). The post offers wide experience, as large Orthopædic and Thoracic Units are located in the Hospital in addition to the general surgical and gynæcological wards. Appointment may be either resident or non-resident. If resident, a charge at the rate of £170 p.a. will be made.

Address written applications, stating age, nationality, qualifications with dates, experience, details of previous appointments, and 2 names and addresses for reference, to—

W. BOWRING, Group Secretary.

Pinderfields General Hospital, Wakefield.

WAKEFIELD. STANLEY ROYD HOSPITAL. Locum Tenens JUNIOR HOSPITAL MEDICAL OFFICER in Psychiatry required. Salary £19 5s. per week. Accommodation for single person at charge of £3 5s. 6d. per week.

Address written applications to W. BOWRING, Group Secretary, Pinderfields General Hospital, Wakefield.

WARRINGTON INFIRMARY. Applications are invited from Males and Females for the post of RESIDENT CASUALTY OFFICER (graded as Junior Hospital Medical Officer) at the above Hospital. The post becomes vacant on 1st November, 1957, and is recognised for the F.R.C.S. Scale of salary £852 10s.–£55–£1182 10s., less a deduction of £170 for residential emoluments. A whole-time Senior Hospital Medical Officer is in charge of the Department.

Applications, stating age, experience and qualifications, should be forwarded to—

HENRY L. BOOT, Group Secretary,
Warrington and District Hospital Management Committee.
c/o General Hospital, Warrington, Lancs.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) HOUSE SURGEON (post recognised by Royal College of Surgeons) required for general surgery with some E.N.T. duties. Approved pre-registration post. Vacant 1st December.

Applications, with copies of 2 testimonials, to Group Secretary.

WINCHESTER. ROYAL HAMPSHIRE COUNTY HOSPITAL. (315 Beds.) SENIOR HOUSE OFFICER (orthopædics) required. Post recognised F.R.C.S. Wide experience available under Area Orthopædic team. Appointment for 6 months in first instance. Vacant 11th November.

Applications, with copies of 2 testimonials, to the Group Secretary.

WINDSOR. KING EDWARD VII HOSPITAL. Obstetric AND GYNÆCOLOGICAL HOUSE SURGEON required, Male or Female, for post vacant 6th November. Post recognised for both M.R.C.O.G. and D.Obst.R.C.O.G. Not a pre-registration post. Successful candidate will be resident at Old Windsor Unit of the Hospital.

Applications, stating age, nationality, qualifications with dates, and copies of recent testimonials or names of 3 referees, to Secretary by 16th October.

WOLVERHAMPTON GROUP OF HOSPITALS. Whole-time SENIOR REGISTRAR in Pædiatrics. Duties mainly at Royal Hospital, Wolverhampton, and Penn Annexe (60 children's beds), recognised for D.C.H., and also at New Cross Hospital. Experience general medicine and pædiatrics essential. Higher qualification an advantage. Successful candidate may subsequently be required to spend not more than 2 years in the Children's Hospital of the United Birmingham Hospitals in accordance with the arrangements for interchange of Registrars agreed between the 2 Boards.

Application forms from Secretary, Birmingham Regional Hospital Board, 10, Augustus-road, Birmingham, 15, to be returned by 28th October, 1957.

WORCESTER (near). POWICK HOSPITAL. Locum JUNIOR HOSPITAL MEDICAL OFFICER required.

Applications, with copies of testimonials, to Medical Superintendent.

WORTHING GROUP HOSPITAL MANAGEMENT COMMITTEE. Applications are invited for the post of REGISTRAR in Pathology, vacant now. This is a Group appointment with duties at the 2 main Hospitals, Southlands Hospital (427 Beds) and Worthing Hospital (210 Beds).

Forms of application are available from the undersigned.

A. V. OAKTON, Group Secretary.

129, Brighton-road, Worthing, Sussex.

DUBLIN. DR. STEEVENS' HOSPITAL. Applications are invited for the position of RESIDENT ANÆSTHETIC REGISTRAR. Commencing salary, including board and lodging, £350 p.a.

Applicants should send applications, giving age and full qualifications (if any) and copies of testimonials, to the undersigned within 14 days after publication of this advertisement.

WILLIAM KENNEDY, Secretary.

NORTHERN IRELAND HOSPITALS AUTHORITY. Applications are invited for a whole-time post as REGISTRAR in Physical Medicine at hospitals managed by the Belfast Hospital Management Committee. The terms and conditions will be in accordance with the application of the Spens report to Northern Ireland. Applicants should hold Part I of the Diploma in Physical Medicine.

Applications to be made on a form obtainable (with further particulars) from the Secretary, Northern Ireland Hospitals Authority, 44–46, Queen-street, Belfast, and to be returned not later than 31st October, 1957.

U.S.A. MUHLENBERG HOSPITAL, Plainfield, N.J. INTERNSHIP, 400-Bed hospital 25 miles from New York City. Teaching programme directed by Johns Hopkins faculty member. $140 monthly stipend plus full maintenance. Transportation advanced.

Inquiries to Director.

Public Appointments

AUSTRALIA. NEW SOUTH WALES DIVISION OF MENTAL HYGIENE. DEPARTMENT OF PUBLIC HEALTH. Applications are invited for the positions of DEPUTY MEDICAL SUPERINTENDENTS and SENIOR MEDICAL OFFICERS. Salary: Deputy Medical Superintendents £A2740 p.a.; Senior Medical Officers £A2565 p.a. Applicants must be graduates in Medicine and possess a recognised Diploma in Psychological Medicine or equivalent qualifications and have had previous experience in psychiatry in private practice or in mental hospitals. Vacancies available in Mental Hospitals in Sydney and country centres. Residence available at attractive rentals for married appointees, board and lodging available at reasonable rates for single appointees. Subject to passing a medical examination, appointee will be eligible to contribute to the State Superannuation Fund. First-class ship fares of appointee and family to Sydney will be paid.

Applications (6 copies), together with 6 copies of testimonials and other supporting documents, should be lodged at the office of the Agent General for New South Wales, 56, Strand, London, W.C.2, by 15th October, 1957. No special forms of application are available.

THE MEDICAL SERVICE OF THE ROYAL NAVY

VACANCIES FOR MEDICAL OFFICERS

Candidates are invited for Short Service Commissions of 3 years, on termination of which a gratuity of £600 (tax free) is payable. Ample opportunity is granted for transfer to Permanent Commissions on completion of 1 year's total service. Officers so transferred are paid instead a grant of £1500 (taxable).

All entrants are required to be British subjects whose parents are British subjects, medically qualified, physically fit, and to pass an interview.

Full particulars from the Admiralty Medical Department, Queen Anne's Mansions, St. James's Park, London, S.W.1.

FACTORY DOCTORS. Factories Acts, 1937 and 1948. The following appointments as Appointed Factory Doctor are vacant. Apply to Chief Inspector of Factories, 19, St. James's-square, London, S.W.1.

District	County	Latest date for receipt of applications
LOCHGELLY ..	FIFE	2ND NOVEMBER, 1957
ST. DAVID'S ..	PEMBROKE ..	2ND NOVEMBER, 1957
CREWKERNE ..	SOMERSET ..	2ND NOVEMBER, 1957

MUNICIPAL BOARD OF MOMBASA. Applications are invited for the appointment of DEPUTY MEDICAL OFFICER OF HEALTH. Salary £1828–£64–£2148. Mileage allowance, house allowance or unfurnished housing at 10% of salary. Applicants must be registered medical practitioners, holding the Diploma of Public Health or equivalent qualification. Experience in tuberculosis control an advantage. Medical certificate of fitness required before appointment. Passages and home leave in accordance with the Board's terms of service. Full particulars on request. Personal canvassing disqualifies.

Apply before 6th November, 1957, to Town Clerk, P.O. Box 440, Mombasa, Kenya, enclosing a recent photograph. Successful applicant required to pass Ki-Swahili Examination within 2 years of appointment. A. V. RATCLIFF, Town Clerk.

Town Hall, Mombasa, 7th September, 1957.

NAIROBI. CITY OF NAIROBI. Appointment of Assis-TANT MEDICAL OFFICERS. Applications are invited from experienced lady doctors for the following appointments in the African Maternity and Child Welfare Section of the Public Health Department. This section of the Public Health Department is conducted on similar lines to such a section in the United Kingdom. There are 14 clinics, each supervised by a European health visitor and with trained African Staff. Home visiting and teaching, conducted from the clinics, is greatly stressed and a domiciliary midwifery service, which is of extreme importance, is also under the supervision of this section. Everything is basic—teaching, standards, equipment. Applicants must have personality, initiative and energy above the average. There are 3 doctors in the section. Only basic medical qualifications are essential but preference may be given to candidates with public health or child welfare qualifications, or with Colonial experience. A good knowledge of the Swahili language within 6 months and a first-class understanding within 2 years will be expected.

(*a*) ASSISTANT MEDICAL OFFICER (Senior post). The appointment is a permanent established post and the consolidated salary scale is £1879–£60–£2239 p.a. The doctor appointed to this post will be in charge of the section. The duties will be administrative and clinical. Ability in personnel administration is essential.

(*b*) ASSISTANT MEDICAL OFFICER (Junior post). The appointment is a permanent established post and the consolidated salary scale is £1529–£50–£1979 p.a. The doctor appointed to this post will be required to do clinical work almost entirely. Applicants are also to state clearly for which post they are applying and applicants for the senior post should state whether they wish to be considered for the junior post in the event of their application for the senior post being unsuccessful. The successful applicants will be required to pass a medical examination before appointment.

Application forms, together with a summary of main terms and conditions of service applicable to the appointment, are available on request from the East African Office, Grand Buildings, Trafalgar-square, London, W.C.2, and applications on such forms should be addressed endorsed "Application for Employment" so as to reach the Establishment Officer, P.O. Box 30037, Nairobi, Kenya, not later than 7th November, 1957. Canvassing either directly or indirectly will be a disqualification.

JOHN RISEBOROUGH, Town Clerk.

Town Hall, P.O. Box 30075, Nairobi, 26th September, 1957.

NAVY, ARMY AND AIR FORCE INSTITUTES. Appli-cations are invited from general practitioners in the undernoted towns for the appointment in a part-time capacity as MEDICAL OFFICERS to this Corporation. Successful applicants would be required to examine and report on the condition of employees of the Corporation who may be referred to them from time to time. Fees for this work will be paid on a scale agreed with the British Medical Association.

Applications, giving details of qualifications and experience, should be sent to the Chief Medical Officer, Navy, Army and Air Force Institutes, Kennington-lane, London, S.E.11, not later than 26th October, 1957.

The towns for which applications are invited are :—

DONCASTER	LEEDS	YORK	HULL
HARROGATE	NEWCASTLE	CARLISLE	PENRITH

REGIONAL MEDICAL HEALTH OFFICERS

required by

SASKATCHEWAN DEPARTMENT OF PUBLIC HEALTH

Salary range : $771–$924 per month.

Requirements : Graduation from an approved school of medicine and some medical and administrative experience. Diploma or Masters degree in Public Health desirable but not essential. To do professional medical and administrative work as Medical Health Officers in organised health regions, with populations of approximately 50,000 and to develop regional preventive health services and a general public health programme.

Benefits : 3-weeks holiday and 3-weeks accumulative sick leave annually with pay, generous pension plan and opportunity for assisted postgraduate training.

Applications : Forms and further information available at PUBLIC SERVICE COMMISSION, Legislative Building and Department of Public Health, Provincial Health Building, Regina, Sask., Canada. Applicants should refer to file No. 5024.

LANCASHIRE COUNTY COUNCIL. Applications are invited from registered medical practitioners for appointment as ASSISTANT DIVISIONAL MEDICAL OFFICERS in the County area north west of Oldham and in the vicinity of Liverpool and Warrington. Possession of Diploma in Public Health desirable. Salary £1050 rising to £1475 p.a. Travelling and subsistence allowances where applicable.

Application forms and further particulars from County Medical Officer, Serial 454, East Cliff County Offices, Preston. Application forms to be returned by 26th October, 1957.

MIDDLESBROUGH. COUNTY BOROUGH OF MID-DLESBROUGH. SENIOR ASSISTANT MEDICAL OFFICER OF HEALTH AND SCHOOL MEDICAL OFFICER. Applicants must be registered medical practitioners having the D.P.H. or equivalent, and previous experience in public health, mental health, or in general practice. The work will be administrative as well as in the field. Salary £1200–£50 (3)–£55 (5)–£1625 p.a.

Applications, with names of 3 referees, to the Medical Officer of Health, 26, Southfield-road, Middlesbrough, by 28th October, 1957.

MIDDLESBROUGH. COUNTY BOROUGH OF MID-DLESBROUGH. PSYCHIATRIC SOCIAL WORKER. Candidates should hold the Mental Health Certificate of the London School of Economics and Political Science (University of London), or the Certificate for Psychiatric Social Workers of the Universities of Manchester, Edinburgh or Liverpool. Whitley Council salary and conditions of service.

Forms of application from the Medical Officer of Health, 26, Southfield-road, Middlesbrough, returnable by 28th October, 1957.

General Practice

For an Executive Council post (England and Wales) apply on form E.C.16A obtainable from the council. Mark envelope "Vacancy."

BOOTLE, LANCASHIRE. Applications are invited for medical practice VACANCY (urban). List at 1st July, 1957, 2141. Residence available for sale, and surgery premises for letting. Apply on Form E.C.16A before 31st October, 1957, to—

T. ARTHUR JONES, Clerk of the Council.

Bootle Executive Council, 61, Balliol-road, Bootle, 20, Lancs.

DAGENHAM, ESSEX. Applications invited for retire-ment VACANCY (urban—designated area). List at present approximately 1675. Residential and surgery accommodation will be available by purchase. Apply on Form E.C.16A by first post on the 25th October, 1957, to—

E. BERGDAHL, Clerk of the Council.

Essex Executive Council, 131/3, Fillebrook-road, Leytonstone, E.11.

MANCHESTER. Applications invited from doctors wish-ing to undertake General Medical Services in Manchester. The list number of the resigning doctor is approximately 1922. The successful applicant will be required to obtain surgery accommodation. Applications, on Form E.C.16A (obtainable from address below) must be received by the undersigned not later than 19th October, 1957. H. GLASS, Clerk of the Council.

Ardwick Town Hall, Ardwick Green North, Manchester, 12.

Hospital Services : Non-Medical Appointment

BARROW AND FURNESS HOSPITAL MANAGEMENT COMMITTEE. GROUP PATHOLOGY DEPARTMENT. Applications are invited from suitably qualified persons for the post of NON-MEDICAL BIOCHEMIST (basic grade) in the Group Pathology Department, Barrow-in-Furness. Whitley Council salary and conditions of service.

Applications, stating age, qualifications, and experience, with names of 2 referees, to the Group Secretary, 105, Abbey-road, Barrow-in-Furness.

Miscellaneous

Consulting Physician required by National Iranian Oil Company for Oilfield areas in Iran to undertake a 2-year tour of duty followed by possible extension after paid home leave. Qualification M.R.C.P., age not less than 35 with at least 5 years experience as practitioner. Salary £3900 annually nett. Married accommodation and free family passages by air available.—Apply with brief details for further particulars to Manager, Personnel Dept., IRANIAN OIL SERVICES LTD., 3, Finsbury-square, London, E.C.2.

Partner needed to take full charge of non-N.H.S. practice. Fully equipped and up-to-date surgery and waiting-room. Principal intends going to sea.—37, Wrotham-road, Gravesend, Kent.

Wimpole-street. Ground-floor consulting-room in pleasant, well-run house available for Medical Consultant or Private Dental Practice. £350 p.a. inclusive.—Tel. WEL 0476.

"Pregnancy Diagnosis by the Xenopus Method," 24-hour service. Send specimens of urine and £1 1s. fee. Hematology, Biochemistry, Flame Photometry.—WELBECK BIOLOGICAL LABORATORIES, 26, Park-crescent, Portland-place, W.1 (MUSeum 5386–7).

Applicants for posts requiring testimonials copied or duplicated should communicate with MANTON SECRETARIAL SERVICE LTD., 98, Victoria-street, S.W.1 (Phone : VICtoria 0141), who are specialists in this kind of work.

H. J. Heinz Company Limited, Waxlow-road, London, N.W.10, wishes to thank all applicants for the post of Medical Officer to their factories in Wigan, advertised in these columns and to state that the appointment has now been filled.

Government Surplus. 25,000 new white operation gowns, 6000 new white 3-pint china basins packed in cases (20 in case), 3500 new linen hospital masks, 1000 new green baize aprons, 750 new hospital flannel shirts.—Write : BASSETT, 331, Kingsland-road, E.8 (Phone : CLIsold 7037).

PUBLISHED by the PROPRIETORS, THE LANCET LIMITED, 7, Adam Street, Adelphi, in the County of London.
Printed by HAZELL, WATSON & VINEY, LTD., London and Aylesbury—Saturday, October 12, 1957.
PRINTED IN GREAT BRITAIN—Entered as Second Class at the New York, U.S.A., Office.

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Paynocil tablets are pleasant to take. They disperse instantly on the tongue and need no water, no chewing, no swallowing whole, and no disguising.

* *Brit. med. J.*, ii, 762, 1957.

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FOR ADULTS

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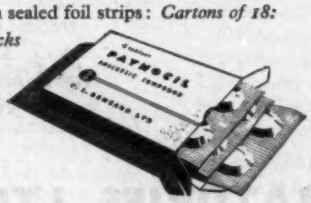

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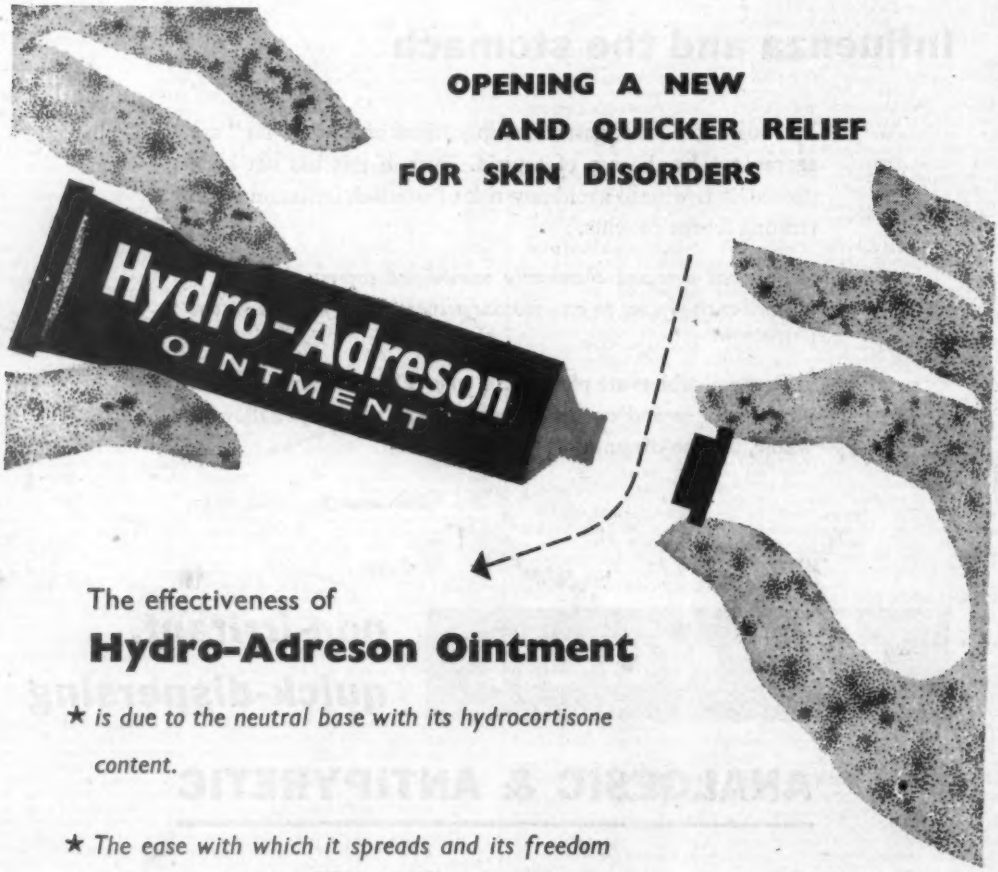

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